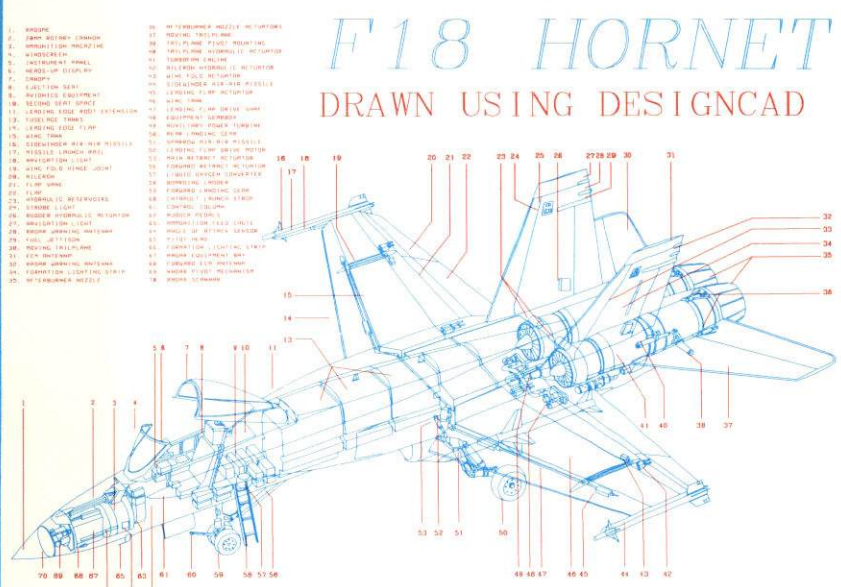
DesignCAD

The Easy to Use CAD System

Installation and Tutorial



DesignCAD
The Easy-to-Use CAD System

User's Guide

(c) 1987 All Rights Reserved
American Small Business Computers, Inc.
118 South Mill Street
Pryor, OK 74361

(918) 825-4844
Telex 9102400302

TABLE OF CONTENTS

SYSTEM REQUIREMENTSS ----------1
INTRODUCTION ----------2
DESIGNCAD FEATURES AND BENEFITS ----------3
DESIGNCAD DISKS ----------4
GETTING STARTED - USING A HARD DRIVE ----------6
GETTING STARTED - USING 5.25" FLOPPY DISK DRIVES ---8
GETTING STARTED - USING 3.5" FLOPPY DISK DRIVES ---10
THE CONFIGURATION PROGRAM ----------12
CONTROLLING THE CURSOR ----------17
SETTING POINTS ----------19
DRAWING A LINE ----------20
ERASING THE SCREEN ----------20
DRAWING A CURVE ----------21
DRAWING A CIRCLE ----------22
DRAWING AN ARC ----------23
WRITING YOUR NAME ----------24
USING THE ZOOM ----------26
LESSON 1: DRAWING A STAR. ----------27
LESSON 2: DRAWING A CAR ----------39
LESSON 3: DRAWINA A HOUSE ----------52
LESSON 4: PRINTING A SCALE DRAWING. ----------65
LESSON 5: USING MENU COMMANDS ----------66
LESSON 6: DIMENSIONS AND LAYERS ----------69
HELP!!! ----------71

SYSTEM REQUIREMENTS

DesignCAD requires a minimum of 512K RAM and a graphics display. 640K RAM is recommended. A math coprocessor is supported, but not required. A mouse or digitizing tablet can be used, but these are not required. Output can be produced on a dot-matrix printer or a plotter.

DESIGNCAD

Computer Aided Design System

INTRODUCTION

Thank you for purchasing DesignCAD. If you have problems, questions, or suggestions concerning DesignCAD, feel free to call (918) 825-4844 for help.

DesignCAD is a powerful computer aided design system. While its features and capabilities compare to CAD systems costing thousands of dollars, DesignCAD is extremely easy-to-use, and virtually anybody can make detailed drawings of professional quality.

With DesignCAD, you can make drawings of all sorts from engineering to artwork. You can make a drawing, modify it, move parts around, and even merge drawings. Once you have the final product, you can get it on paper using any of the host of printers and plotters supported by DesignCAD.

There is a file on the DesignCAD Configuration Disk called README. This file contains information on the latest changes and enhancements to DesignCAD. You can print this file by entering the DOS command:

```
PRINT README
```

DESIGNCAD FEATURES AND BENEFITS

* Has easy-to-use single keystroke commands as well as on-screen command menus.

* Provides a precise on-screen zoom command to change sizes of drawings.

* Provides extensive editing capabilities.

* Draws curves, circles, ellipses, and arcs easily.

* Has exceptional text drawing features.

* Allows lines of varying thickness to be used.

* Provides "area fill" capability with different hatching patterns.

* Allows figures and symbols to be created, stored, and retrieved at any location, size, or angle.

* Provides advance CAD features such as Auto Dimensioning, Fillets, and Chamfers.

* Provides for user-created files to be input and displayed on the screen. This allows data from other programs to be used.

* Produces very high quality output on most plotters and dot matrix printers.

* Performs area and length calculations.

* Provides complete macro capabilities.

* Draws parallel, perpendicular, and tangent lines automatically.

DESIGNCAD DISKS

There are several disks that come with DesignCAD:

PROGRAM DISK 1 - This disk contains the DesignCAD program for use in systems which DO NOT have a math coprocessor. This disk may be used in a system with a math coprocessor, but the execution speed of the program will be much slower than that of Program Disk #2.

PROGRAM DISK 2 (MATH COPROCESSOR VERSION) - This disk also contains the DesignCAD program. This version is intended for use in systems which DO have a math coprocessor. If you attempt to use this disk in a system which does not contain a math coprocessor you should see a FLOATING POINT NOT LOADED error. Use of a math coprocessor will result in a 20-40% increase in drawing speed. DO NOT COPY BOTH THE COPROCESSOR AND THE NON COPROCESSOR VERSION OF THE PROGRAM ONTO YOUR HARD DISK.

CONFIGURATION DISK - This disk contains the Configuration program called SETUP. This program configures DesignCAD to match your hardware configuration. The DXF Interchange utility is also found on this disk.

UTILITY DISK - This disk contains the DesignCAD utility and file transfer programs:

1. DCIMPORT - File transfer utility to read graphics files from other systems. Formats supported: HPGL files, X-Y-Z Coordinate files, and ASCII Text files.

2. DCEXPORT - File transfer utility to produce drawing files for other software. Formats supported: IGES, Ventura (GEM), and Postscript.

3. IGESIN - File transfer utility to read IGES files.

4. PLOTSORT - Utility to optimize drawing files for plotting.

5. MATERIAL - Materials list program.

6. BREAKDC - Utility to break up a large DesignCAD drawing into smaller drawings.

PRINT DISK - The Print Disk contains programs for outputting your drawings to a dot matrix printer. The ALTPRINT file must be run if you do not have a math coprocessor. (If you have DesignCAD on 3.5" disks, then the Print Disk is included on the Program Disks.)

SYMBOL LIBRARY DISKS - The remaining disks contain DesignCAD drawings which are common symbols used by Engineers, Architects, and Designers.

GETTING STARTED - USING A HARD DRIVE

The first thing you should do is fill out your owner registration card and mail it. This will insure that you will be notified when future updates are available.

Then make a backup copy of your DesignCAD disks. Use the DISKCOPY command from DOS:

```
DISKCOPY
(or DISKCOPY A: B: if you have two floppy drives)
```

When instructed, place the first DesignCAD disk (source) and a blank disk (destination) into the floppy drive(s). After the copy operation is complete, make a copy of the other DesignCAD disks in the same manner. Store the original DesignCAD disks in a safe place.

Now create a DesignCAD subdirectory on your hard drive:

```
MD \DC
```

Next, change to the DesignCAD subdirectory and copy all the DesignCAD files to the hard drive using the following commands:

```
CD \DC
COPY A:*.*
```

Repeat the COPY command to copy files onto your hard drive from EITHER Program Disk #1 or #2, but not both. Use Program Disk #1 if you DO NOT have a math coprocessor, and Program Disk #2 if you DO have a math coprocessor. Then copy all the other DesignCAD disks.

NOTE: DO NOT COPY PROGRAM DISK #2 ONTO YOUR HARD DRIVE IF YOU DO NOT HAVE A MATH COPROCESSOR.

Step 1: Make a DesignCAD Subdirectory.
Step 2: Change to the DesignCAD Subdirectory.
Step 3: Copy Program Disks #1 OR #2, and all the other DesignCAD disks. (Program Disk #1 is for use without a math coprocessor, Program Disk #2 is for use with a coprocessor.
Step 4: Run SETUP.
Step 5: Enter "DC" to run DesignCAD.

NOTE: DO NOT COPY PROGRAM DISK #2 ONTO YOUR HARD DRIVE IF YOU DO NOT HAVE A MATH COPROCESSOR.

GETTING STARTED - USING 5.25" FLOPPY DISK DRIVES

The first thing you should do is fill out your owner registration card and mail it. This will insure that you will be notified when future updates are available.

Then make a backup copy of your DesignCAD disks. Use the DISKCOPY command from DOS:

```
DISKCOPY
(or DISKCOPY A: B: if you have two floppy drives)
```

When instructed, place the first DesignCAD disk (source) and a blank disk (destination) into the floppy drive(s). After the copy operation is complete, make a copy of the other DesignCAD disks in the same manner. Store the original DesignCAD disks in a safe place.

If you do not have a math coprocessor, place the Print disk into drive A: and enter ALTPRINT to select the correct print program. (To change back to the coprocessor version of the Print program, enter ALTPRINT 87.)

You are now ready to run the DesignCAD Configuration program. Place the CONFIGURATION DISK into drive A:, and enter SETUP. Enter all the configuration information, (See the following section) and insert the PRINT DISK and the correct PROGRAM DISK into drive A: when instructed. (Use Program Disk #1 if you DO NOT HAVE a math coprocessor, and Program Disk #2 if you DO HAVE a coprocessor.)

Then, enter DC to run DesignCAD.

Summary:

Step 1: Backup the original DesignCAD disks.

Step 2: If you do not have a math coprocessor, place the Print Disk in drive A: and enter ALTPRINT.

Step 3: Place the CONFIGURATION DISK into drive A: and run SETUP.

Step 4: Replace the disks as instructed

Step 5: Enter "DC" to run DesignCAD.

GETTING STARTED - USING 3.5" FLOPPY DISK DRIVES

NOTE: DesignCAD is available on 5.25" and 3.5" disks. If you have the wrong disk size, you can send the package to us for a free exchange:

American Small Business Computers, Inc.
118 South Mill Street
Pryor, OK 74361

Begin by making a backup copy of your DesignCAD disks. Use the DISKCOPY command from DOS:

```
DISKCOPY A: B:
```

When instructed, place the DesignCAD program disk (source) into drive A and a blank disk (destination) into drive B. After the copy operation is complete, make a copy of the remaining disks in the same manner. Store the original DesignCAD disks in a safe place.

You are now ready to run the DesignCAD setup program. Place the CONFIGURATION DISK into drive A:, and enter SETUP. Enter all the configuration information, (See the following section).

When you are asked to insert the Print Disk into drive A:, insert the Program Disk (#1 if you DO NOT HAVE a math coprocessor, or #2 if you DO HAVE a math coprocessor). Leave that disk in and press ENTER when you are asked to insert the Program Disk.

Then, enter DC to run DesignCAD.

Summary:

Step 1: Backup the original DesignCAD disks.

Step 2: Place the CONFIGURATION DISK into drive A: and run SETUP.

Step 3: When instructed, replace the Configuration Disk with the Print Disk in the floppy disk drive.

Step 4: Insert Program Disk #1 (for use without a math coprocessor) or Program Disk #2 (for use with a coprocessor) into drive A: when instructed. (Use the Program Disk in place of the Print Disk, also.)

Step 5: Enter "DC" to run DesignCAD.

THE CONFIGURATION PROGRAM

Most printers, plotters, and digitizing pads have their own distinct control codes used to perform their various functions. Because of this, you need to "tell" DesignCAD which devices you use. To do this, run the program SETUP (Enter SETUP from the A> or the C> prompt).

If you do not have a hard drive, you will need to start the SETUP program with DesignCAD Configuration Disk in the floppy drive, and then replace the Configuration Disk with the DesignCAD Print Disk and Program Disk. (Use Program Disk #1 if you do not have a math coprocessor, and Program Disk #2 if you do have a coprocessor.)

First, you will be asked whether you want to use English or Metric units of measurement. These are the units of measurement for the plotter, printer, and digitizer sizes. Your drawings can always be in either English or Metric units.

Next, you will be asked what type of printer you have. If your printer does not appear on the page, press ENTER to go to the next page. To return to the previous page, press ESC. There are several pages of printers.

After you select the printer, you will be asked to select the printer output device - LPT1:, LPT2:, COM1:, or COM2:. Select the port to which your printer is connected. (LPT1: is the most common printer port.)

Next, you will be asked for the type of plotter. If your plotter is not listed among those on the screen, you may select "NONE OF THESE" to set up your own custom plotter codes. As with the printers, press ENTER to go to the next page in the list of plotters, or ESC to go to the previous page.

There are five possible plotter output devices:

1. LPT1:
2. LPT2:
3. COM1:
4. COM2:
5. Disk File

Select the output port to which the plotter is connected. If you need to output the plotter codes to a disk file instead of directly to the plotter, select option 5. When a disk file is used for the plotter output device, you will be asked for the output file name when each plot is made.

After entering the plotter information, you will be asked for the type of mouse or digitizing tablet you use. (Digitizing tablets are also called digitizers and graphics pads.) If you have a digitizing tablet, you will be asked for the size of the tablet and the serial port information after you select the tablet. Be sure the serial information you enter corresponds to that of your digitizing tablet.

If you have a mouse, the mouse device driver supplied by the manufacturer must be loaded before the mouse is used by DesignCAD. (Use MOUSE.COM for the Microsoft or Logitech Mouse, MSMOUSE.COM for the Mouse Systems Mouse).

Next, you will be asked which type of display / graphics adapter you use. If you are not sure, choose the first or second option, IBM Standard Color Graphics. If you are using a monochrome monitor with a 9-pin connector and you aren't sure about the display type, try the Hercules Monochrome option.

NOTE: Be sure that you have selected the correct graphics display. If you find that DesignCAD 3-D displays only the copyright notice during initial

startup and will not proceed, you either have selected the wrong graphics adapter in the SETUP program or the graphics card and/or computer is improperly configured.

After you select the display, you will be asked if you want to change the screen aspect ratio. On your computer display, the horizontal dots or pixels are not the same distance apart as the vertical pixels. The aspect ratio is the distance between horizontal pixels divided by the distance between vertical pixels. The default value should be correct for your screen.

However, if you find that circles are too tall on your screen, make the aspect ratio smaller. Similarly, if a circle is flat on the screen, the aspect ratio can be increased in value. The aspect ratio does not affect the way drawings are printed or plotted.

After all the setup information is entered, the peripheral devices are displayed on the screen. You can change any of them at this point. When all the information is correct, select option 8 to save the information to disk.

If you have a floppy disk drive system, you will be asked to insert different disks into the drive to save the configuration information on the other disks.

If you use a digitizing tablet, you should align the digitizer menu. To do this, select option 6 in the Setup program.

The digitizer menu is the list of commands on a rectangular card. This can be affixed to the upper left corner of your digitizing pad to allow command entry from the digitizing pad.

If you have problems using a mouse, digitizing tablet, or plotter, see the list of cable configurations and switch settings in the DesignCAD 3-D Reference Manual.

After the Setup program has been run once, you can run it again and change only the configuration items than need to be changed. For example, if you need to set the program for a different plotter, you can select just the plotter option. You will not have to enter the information on printers, digitizers, etc.

Now you are ready to load DesignCAD. Enter:

DC

After a brief copyright notice, you will see a screen like one in Figure 1. There is a box framing most of the screen and a status line above. In the center of the box is the cursor. You will use the cursor for entering points on the screen for commands.

To the right of the drawing screen is the command menu. (This can be turned off with the System Parameter command to allow a larger drawing area.) Directly beneath the drawing screen is the Command Line. This is the line from which information is entered for the DesignCAD commands. It is normally blank. To exit DesignCAD, press the F8 key.

NOTE: DesignCAD uses most of the memory in your computer. If you are using any RAM-resident software, it may conflict with DesignCAD. DesignCAD uses MS-DOS standards to allocate memory. Any RAM-resident software that does not can causes unpredictable results.

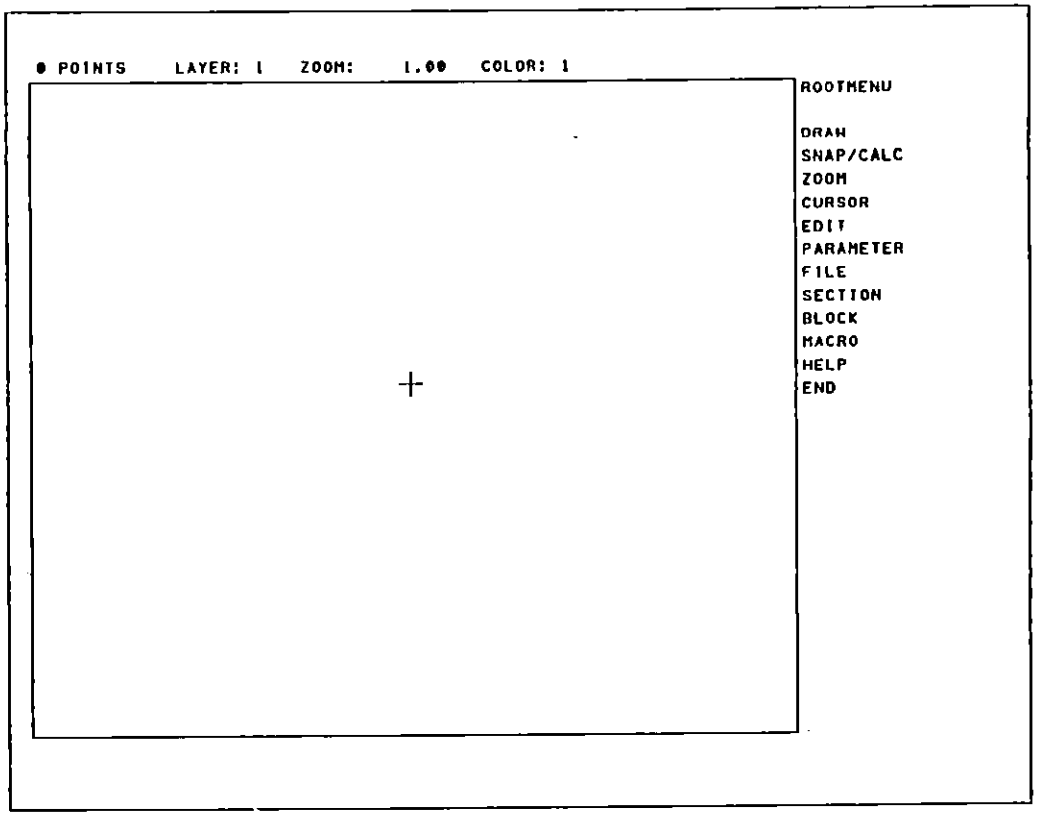

0 POINTS LAYER: 1 ZOOM: 1.00 COLOR: 1
ROOTMENU
DRAW
SNAP/CALC
ZOOM
CURSOR
EDIT
PARAMETER
FILE
SECTION
BLOCK
MACRO
HELP
END

FIGURE 1

CONTROLLING THE CURSOR

You can move the cursor with the numeric keypad using numbers 7, 8, 9, 4, 6, 1, 2, and 3, as shown in Figure 2. Try it. The cursor moves in the direction of the number on the keypad. If the numeric lock (or shift key) is on, the cursor moves in small steps. If the numeric lock is off, the cursor moves in larger steps. It is convenient to leave the numeric lock off for normal cursor movement, and press the shift key for precise cursor positioning.

There are also cursor control keys to move the cursor to the top, bottom, left, or right edge of the screen:

CTRL-4 - Cursor to Left Edge of Screen
CTRL-6 - Cursor to Right Edge of Screen
CTRL-7 - Cursor to Top of Screen
CTRL-1 - Cursor to Bottom of Screen

"CTRL-" means to hold the CTRL key down when you press the 4, 6, 7, or 1 key. (These cursor controls function only on the numeric keypad.)

DesignCAD also supports a mouse or digitizing tablet for cursor movement. This manual refers to cursor movement using the keyboard. If you have a mouse or digitizing tablet, the cursor may be moved using either the keyboard or digitizer.

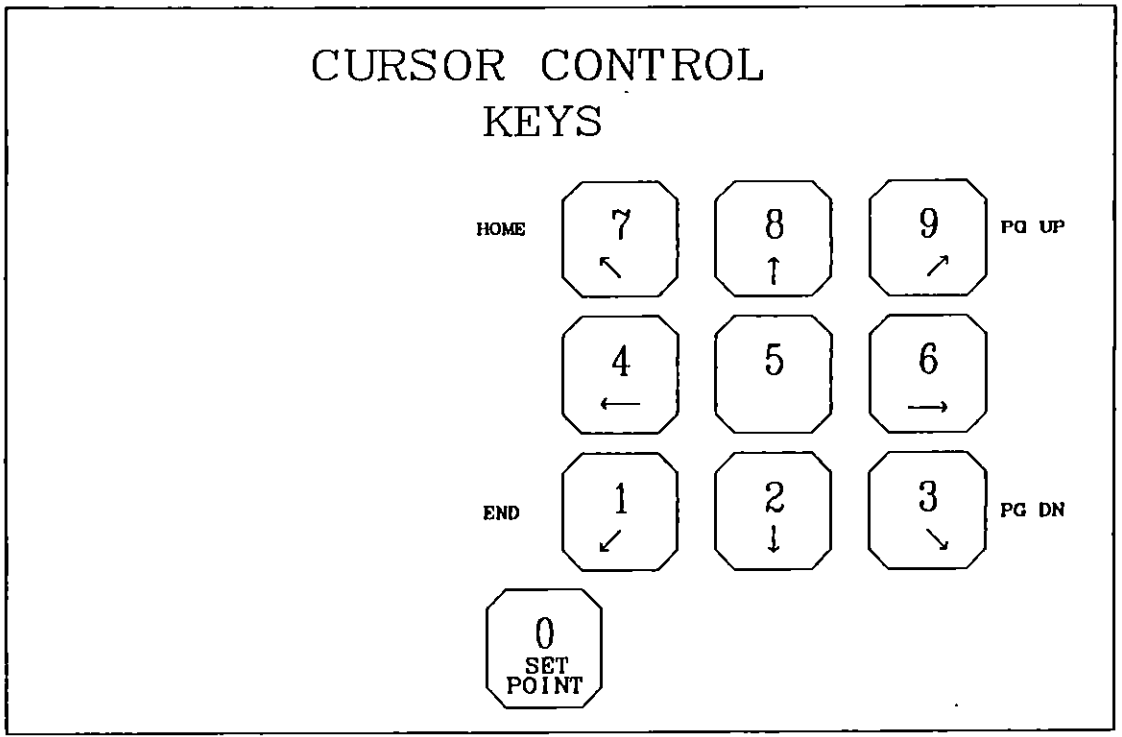

CURSOR CONTROL
KEYS
HOME
7
8
9
PG UP
4
5
6
END
1
2
3
PG DN
0
SET
POINT

FIGURE 2

SETTING POINTS

DesignCAD drawing commands use points as a reference. For example, using the VECTOR command, you can draw a line through a set of points.

These points can be set using the "Ins" key, or "0", on the numeric keypad. You can also set a point using the first button on a mouse or digitizing tablet.

The Insert key and Mouse button cause a point to be set at the current cursor position. Points can be set in a variety of other ways. For other methods of setting points, see the descriptions of the following commands in the DesignCAD Reference Manual.

Set Point using X-Y Coordinates.
Set Point using Polar Coordinates.
Gravity Point.
Line Snap.
Plane Snap.
Midpoint.
Perpendicular.
Tangent.

DRAWING A LINE

Most drawing commands require a set of points for reference. To set a point, move the cursor to the desired position and press the 0 key on the numeric keypad. Try setting three points in a triangle. Next, press the V key (Vector command).

DesignCAD will draw lines from one point to the next. However, you just found a pitfall. The points you set were connected with a line, but it didn't make a triangle the way you planned. In order to complete the triangle, it is necessary to set a fourth point at exactly the same place as the first point. Press the ESC key and try again (using 4 points this time). The ESC key is used to "escape from" or undo the last line or entity drawn.

The Vector command is one of many DesignCAD commands. The DesignCAD Reference manual describes each command in detail.

ERASING THE SCREEN

Press Y, or enter CLEAR ALL. You will be asked:
"Do you really want to erase the screen?"
Press "Y" for yes.

DRAWING A CURVE

Drawing a curve is almost the same as drawing a line. Set the points through which you wish the curve to go and press the C key (for Curve). Try setting four points in a triangle. Next, press the C key. You didn't get a triangle, did you? DesignCAD smoothed the corners and made something that looks more like a teardrop.

The Curve command is explained in detail in the DesignCAD Reference Manual.

DRAWING A CIRCLE

There are several methods of drawing a circle, but probably the easiest is as follows:

Press INSERT to set a point. (This is going to be the center of our circle.)
Press the up arrow key three times.
Press INSERT to set a point. (This is going to be the radius of our circle.)
Press the O key. (The letter, not the number.)

For additional information, read about circles and ovals in the DesignCAD Reference manual.

DRAWING AN ARC

It is easy to draw any arc with DesignCAD. Let's try:

Press INSERT to set a point.
Press the down arrow key three times.
Press INSERT to set a point.
Press A (for arc)

You will be prompted for the angle. Enter 35 and press <ENTER>. The first point you set is the center of the arc. The second point is the beginning angle of the arc and the distance from the center point. The arc is drawn counter-clockwise from the second point.

WRITING YOUR NAME

DesignCAD has excellent text display capabilities. For example, set one point near (about an inch away from) the lower left corner of the screen, as shown in Figure 3. Set another point to the right, near the lower right corner of the screen. Next press the T key (for Text). You will be asked to enter "TEXT:" at the top of the screen. Type your name, followed by the ENTER key.

Your name will be displayed between the two points. You can position the two points anywhere on the screen to display text at any location, size, or angle.

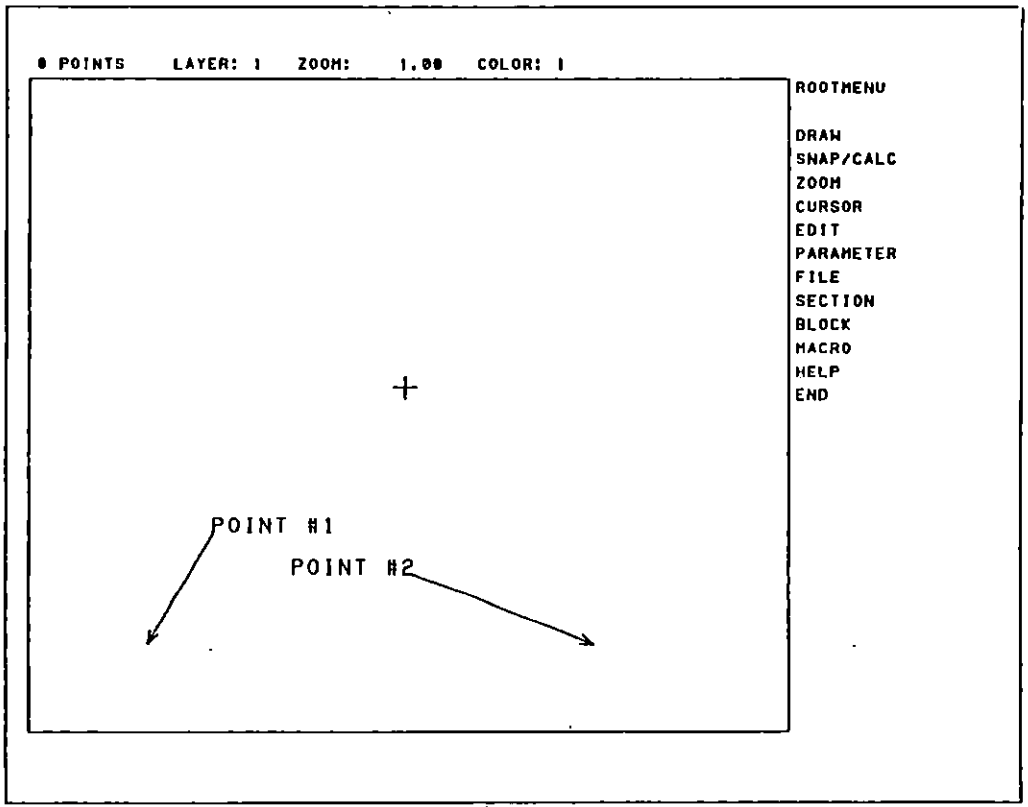

0 POINTS LAYER: 1 ZOOM: 1.00 COLOR: 1
ROOTMENU
DRAW
SNAP/CALC
ZOOM
CURSOR
EDIT
PARAMETER
FILE
SECTION
BLOCK
MACRO
HELP
END
POINT #1
POINT #2

FIGURE 3

USING THE ZOOM

With your name still on the screen, move the cursor to the first letter of your name. Set a point in the center of that letter. Then press the Z key. When asked for the Zoom Factor, enter 2. The first letter of your name will appear on the screen twice as large as it was originally. The rest of your name will follow the first letter, although some of it will lie off to the right of the screen.

LESSON 1: DRAWING A STAR.

This section will explain how to use DesignCAD to draw a star. If you make a mistake, remember that you can use the ESC key to "undo" the last command, and the Erase command (E key) or the Section Delete command (D key) to erase part of the drawing.

To begin, set the Drawing Units so that the screen is 100 units wide. Move the cursor to the left edge of the screen by pressing CTRL-4 on the numeric keypad, and set a point. Then move the cursor to the right side with CTRL-6 and set a point there. Next press the U key, for Units command.

When asked how many units that distance represents, enter 100. Next, use the Drawing Parameter command (Q key) to set the cursor increment to 5 Drawing Units. After you enter the Cursor Step Size, terminate the Drawing Parameter command with the F2 key. This will save the unit size and cursor step size so they will be used automatically every time DesignCAD starts.

Next, use the System Parameter command (ALT-Q) to save the Drawing and System Parameters with the drawing, so you will not have to set it up again.

Position the cursor in the center of the screen by pressing the colon (":") key. You will be prompted at the bottom of the screen to enter a value for X. Type 50 and press ENTER. When you are asked for the Y value, type 40 and press ENTER. When you press Enter after entering the Y value the cursor will jump to the center of the screen and set a point at that location.

What follows is a step-by step script of key presses required to draw the objects. Detailed explanation will be provided where appropriate.

```
Right Arrow 6 steps
<INSERT>
Down Arrow 4 steps
Left Arrow 5 steps
<INSERT>
Up Arrow 6 steps
Right Arrow 2 steps
<INSERT>
Down Arrow 6 steps
Right Arrow 2 steps
<INSERT>
Left Arrow 5 steps
Up Arrow 4 steps
<INSERT>
V                       (Connect the points with a
                         vector or straight line.
                         See Figure 4.)
```

You should have a star on your display now. We didn't do anything tricky. You could have done the same thing with a pencil and paper. Let's try another star with a more sophisticated approach.

```
Y
Y                       (We have to clear the screen.)
:
50 <ENTER>
40 <ENTER>              (We now have a point set at
                         screen center.)

Right Arrow 6 steps
<INSERT>
V
Up Arrow 1 step
<INSERT>                (This is one corner of an area
                         we plan to define as a BLOCK.)

Left Arrow 6 steps
Down Arrow 2 steps
<INSERT>                (This is the other corner of the
                         area to be defined as a BLOCK.)

Right Arrow 3 steps
Up Arrow 1 step
```

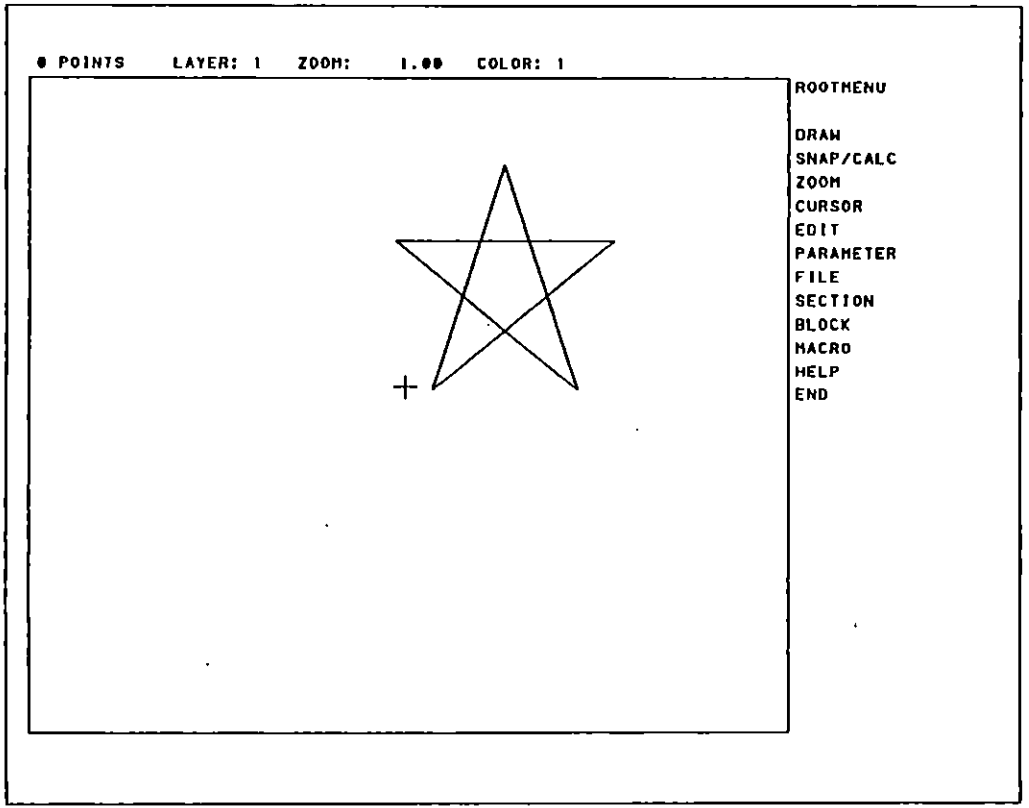

0 POINTS LAYER: 1 ZOOM: 1.00 COLOR: 1
ROOTMENU
DRAW
SNAP/CALC
ZOOM
CURSOR
EDIT
PARAMETER
FILE
SECTION
BLOCK
MACRO
HELP
END

FIGURE 4

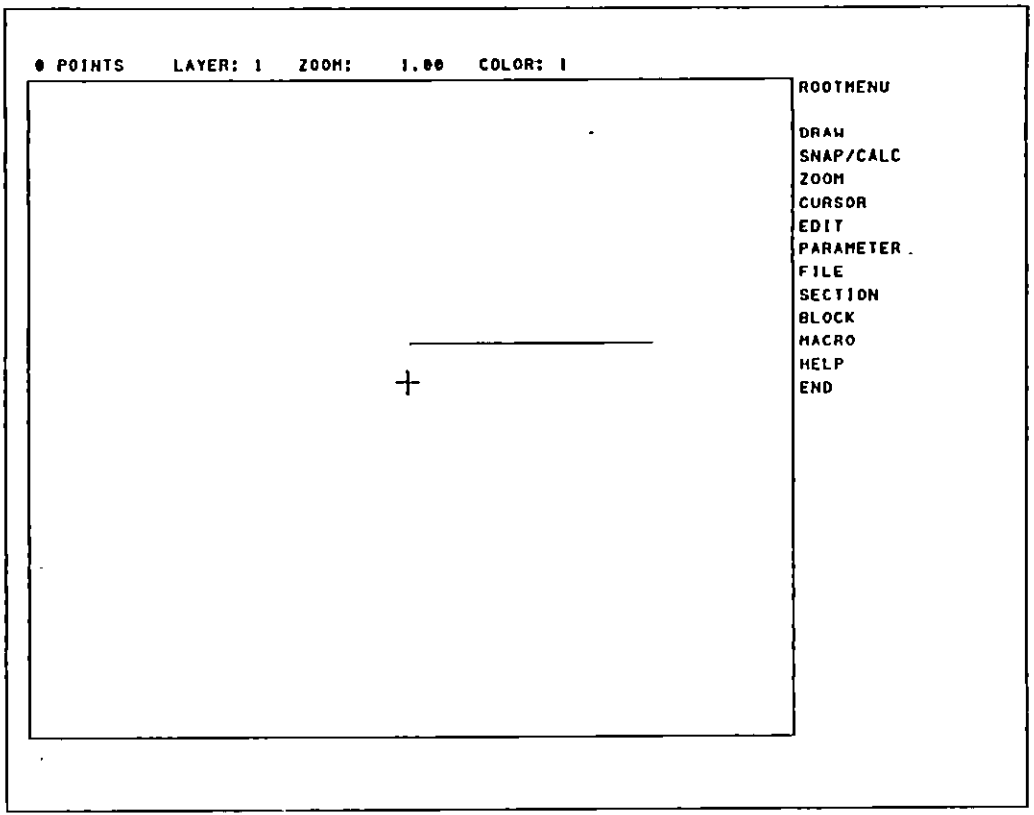

0 POINTS LAYER: 1 ZOOM: 1.00 COLOR: 1
ROOTMENU
DRAW
SNAP/CALC
ZOOM
CURSOR
EDIT
PARAMETER
FILE
SECTION
BLOCK
MACRO
HELP
END

FIGURE 5

<INSERT>	(This is a HANDLE on our BLOCK.)
B	(Now the block is set with the handle on it. See Figure 5.)
<ENTER>	(This activates the command line at the bottom of the screen.)
BC <ENTER>	(We want to do a BLOCK CIRCLE.)
<INSERT>	(Locate the handle of the first block at this point.)
Down Arrow 1 step	
<INSERT>	(This is the center about which the block will be repeated.
5 <ENTER>	(We want 5 copies.)
360 <ENTER>	(We want the copies to occupy a 360 degree arc.)

This time we drew only one side of the star and DesignCAD did the correct calculations for the rest of the star. See figure 4.

Blocks can be very powerful they are used corectly. Let's try another star.

Y
Y
:
50 <ENTER>
40 <ENTER>
Right Arrow 2 steps
Up Arrow 6 steps
<INSERT>
Right Arrow 2 steps
Down Arrow 6 steps
<INSERT>
V
<INSERT>
Left Arrow 4 steps
Up Arrow 6 steps
<INSERT>
Right Arrow 2 steps
Down Arrow 6 steps
<INSERT> (See Figure 6.)

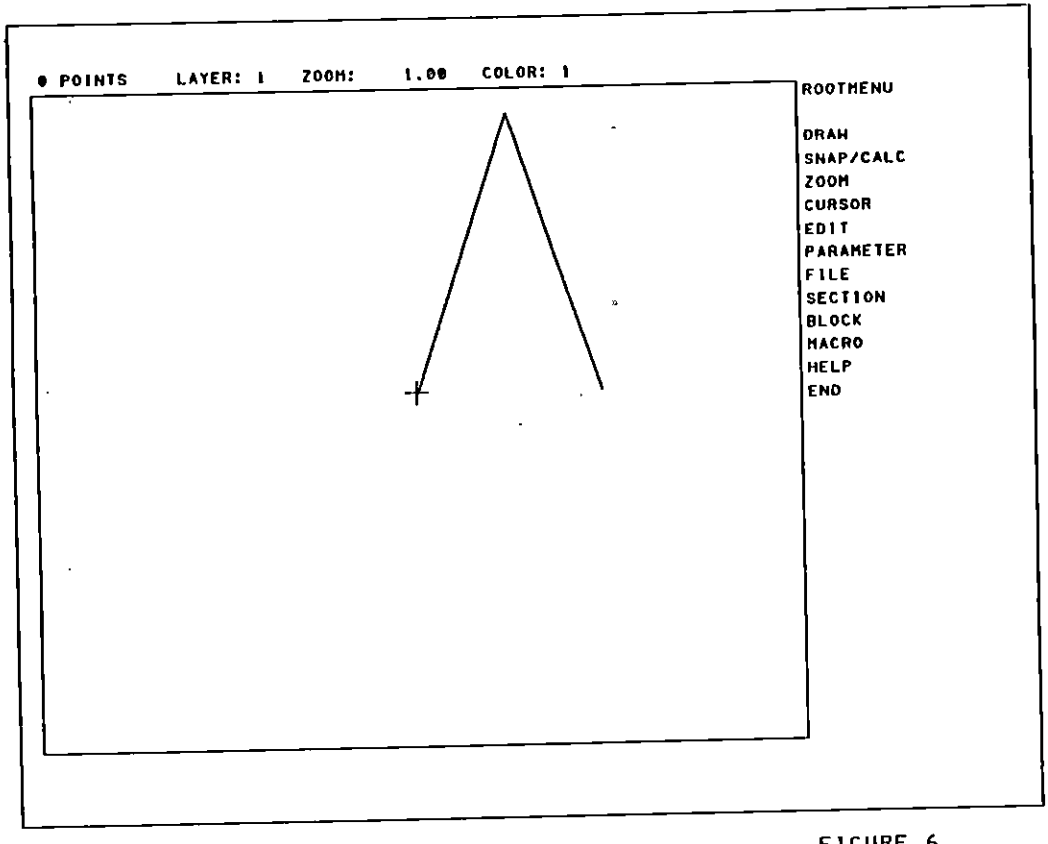

0 POINTS LAYER: 1 ZOOM: 1.00 COLOR: 1
ROOTMENU
DRAW
SNAP/CALC
ZOOM
CURSOR
EDIT
PARAMETER
FILE
SECTION
BLOCK
MACRO
HELP
END

FIGURE 6

```
B
<ENTER>
BC <ENTER>
<INSERT>
Down Arrow 2 steps
<INSERT>
5 <ENTER>
360 <ENTER>              (See Figure 7.)
<INSERT>                 (Define a corner of a section.)
Up Arrow 3 steps
Left Arrow 3 steps
<INSERT>                 (Define the opposite corner.)
<ENTER>
JOIN <ENTER>             (Here's a command that can
                          really help clean up rough
                          drawings.  It finds all of the
                          points in a section and moves
                          them to the average location
                          for that group of points.)
Right Arrow 6 steps
<INSERT>
Left Arrow 2 steps
Down Arrow 2 steps
<INSERT>
<ENTER>
JOIN <ENTER>
<INSERT>
Down Arrow 3 steps
Right Arrow 3 steps
<INSERT>
<ENTER>
JOIN <ENTER>
Left Arrow 3 steps
<INSERT>
Left Arrow 2 steps
Down Arrow 2 steps
<INSERT>
<ENTER>
JOIN <ENTER>
Left Arrow 1 step
```

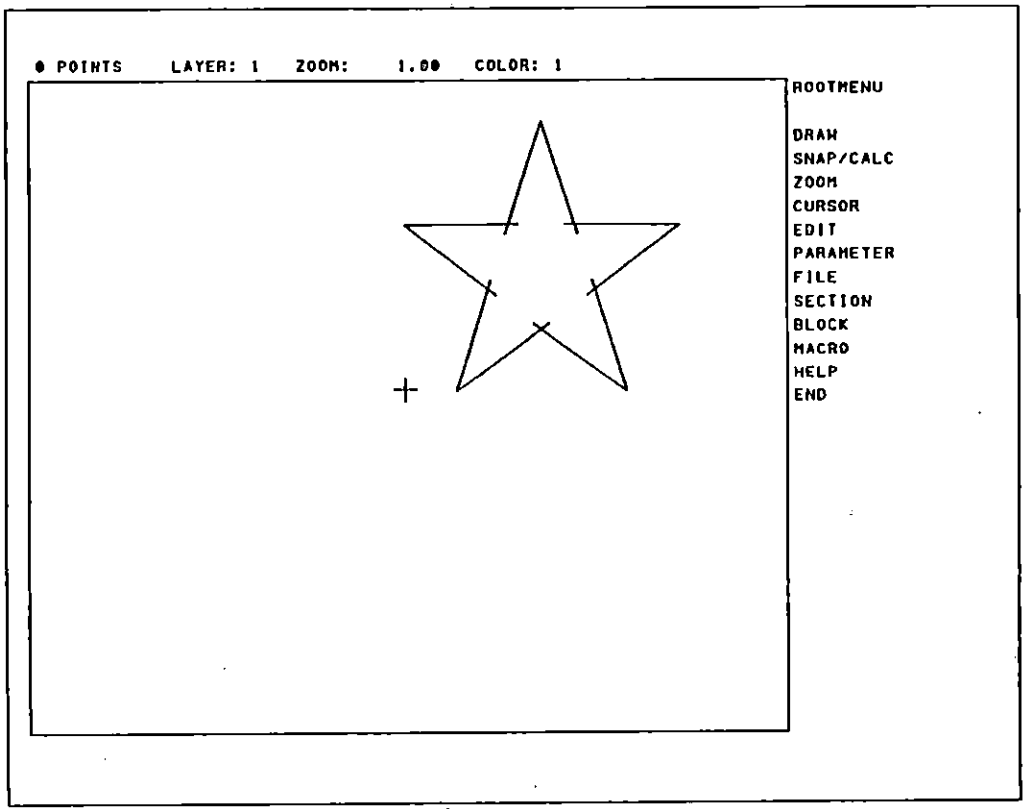

● POINTS LAYER: 1 ZOOM: 1.00 COLOR: 1
ROOTMENU
DRAW
SNAP/CALC
ZOOM
CURSOR
EDIT
PARAMETER
FILE
SECTION
BLOCK
MACRO
HELP
END

FIGURE 7

Up Arrow 2 steps
<INSERT>
Up Arrow 2 steps
Left Arrow 2 steps
<INSERT>
<ENTER>
JOIN <ENTER>

As you may have guessed by now, some amount of trial and error occurred before the exact key presses necessary to draw stars were figured out. What if you have to do this on your own? You already have three different methods of drawing a star. We will provide one more and then go on to something a little bit more usable.

Y
Y
:
50 <ENTER>
40 <ENTER>
Right Arrow 4 steps
<INSERT>
<ENTER>
POLY <ENTER> (Here's something new for you. It will make a polygon with any number of sides.)

5 <ENTER>
. (period)
Up Arrow 4 steps
Left Arrow 5 steps
. (period)
Right Arrow 7 steps
. (period)
Down Arrow 4 steps
Left Arrow 5 steps
. (period)
Up Arrow 6 steps
Right Arrow 2 steps
. (period)
Down Arrow 6 steps

```
Right Arrow 2 steps
.
V                       (See Figure 8.)
Left Arrow 1 step
<INSERT>                (This marks a line.)
E                       (This erases the line marked
                         above.)
```

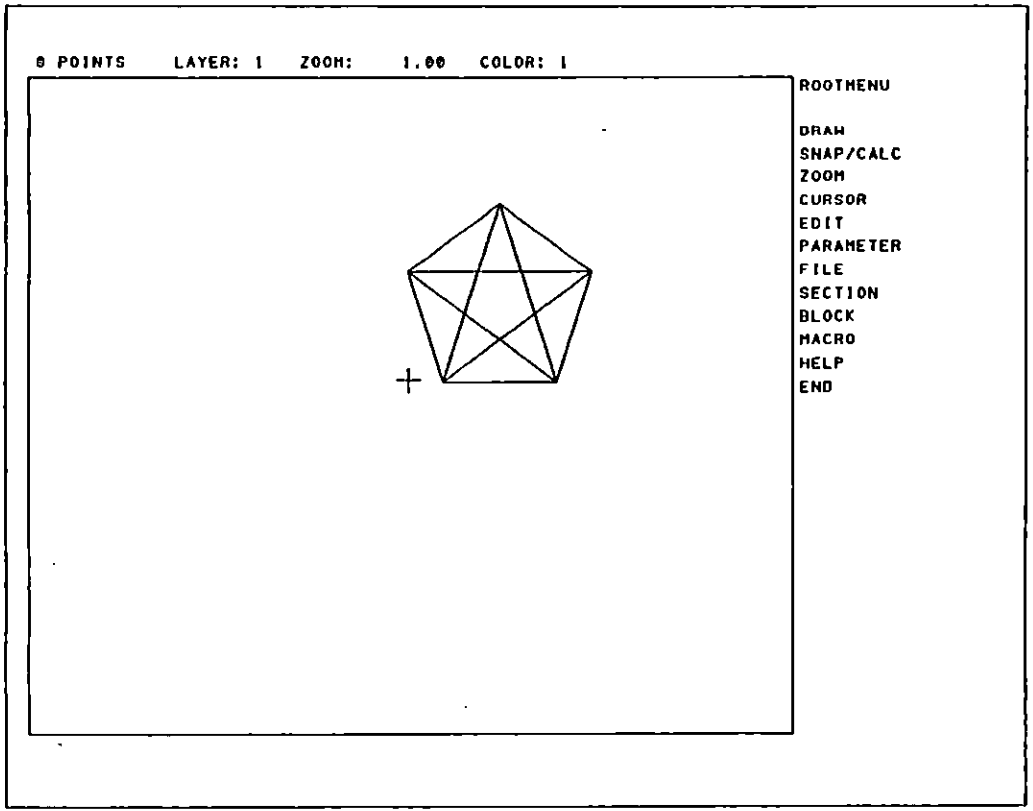

0 POINTS LAYER: 1 ZOOM: 1.00 COLOR: 1
ROOTMENU
DRAW
SNAP/CALC
ZOOM
CURSOR
EDIT
PARAMETER
FILE
SECTION
BLOCK
MACRO
HELP
END

FIGURE 8

LESSON 2: DRAWING A CAR

This section will explain how to use DesignCAD to draw a car. Simply follow the key presses and pay special attention to the notes, because some new concepts will be introduced that will sharpen your DesignCAD skills.

<CTL> Left Arrow
<INSERT>
<CTL> Right Arrow
<INSERT>
U
150 <ENTER> (This tells DesignCAD we want the viewing screen to be 150 units wide.)
Q (This takes us to the Drawing Parameter Screen.)

Go to the line for Cursor Step Size and set it to be 1 unit. Exit the Drawing Parameter screen by pressing the F1 key. If your drawing screen is not clear, press the Y key twice to clear it now.

:
40 <ENTER>
20 <ENTER>
Up Arrow 7 steps
<INSERT>
O (The letter not the number.)
<INSERT>
Up Arrow 4 steps
<INSERT>
= (This draws a line parallel to the circle. This command is very powerful if used correctly.)
Down Arrow 4 steps
Left Arrow 1 step
<INSERT>
Down Arrow 6 steps
<INSERT>

```
Right Arrow 2 steps
<INSERT>
Up Arrow 6 steps
<INSERT>
V
<INSERT>                (This is the upper right corner
                         of a section.)
Down Arrow 6 steps
Left Arrow 2 steps
<INSERT>                (This is the lower left  corner
                         of a section.)
Right Arrow 1 step
<INSERT>                (This is a handle.)
B                       (This sets the section defined
                         above as a block with a handle
                         at the last point set.)
<ENTER>
BC <ENTER>              (We are doing a Block Circle.)
<INSERT>                (We want the handle of the first
                         block here.)
Down Arrow 1 step
<INSERT>                (This is the center about which
                         the block will repeat.)
18 <ENTER>              (We want 18 copies.)
360 <ENTER>             (Spread the copies over a 360
                         degree arc.)
Down Arrow 11 steps
Left Arrow 11 steps
<INSERT>                (This is the lower left corner
                         of a section.)
Right Arrow 22 steps
Up Arrow 22 steps
<INSERT>                (This is the upper right corner
                         of the section.)
<INSERT>                (This is a handle.)
B                       (This sets a block.)
Right Arrow 85 steps
<INSERT>                (This locates the handle for
                         the next operation.)
<ENTER>
BI <ENTER>              (Insert a Block here.
```

	See Figure 9.)
H	(This tells DesignCAD we want to use a new COLOR.)
2 <ENTER>	(On my display this is red. You may see some other color on your display. The color number will determine the pen number used by your plotter.)
Down Arrow 10 steps	
Left Arrow 24 steps	
<INSERT>	
Right Arrow 26 steps	
<INSERT>	
)	(That is a right parenthesis. It draws a semi-circle, clockwise from the first point to the second point. See Figure 10.)

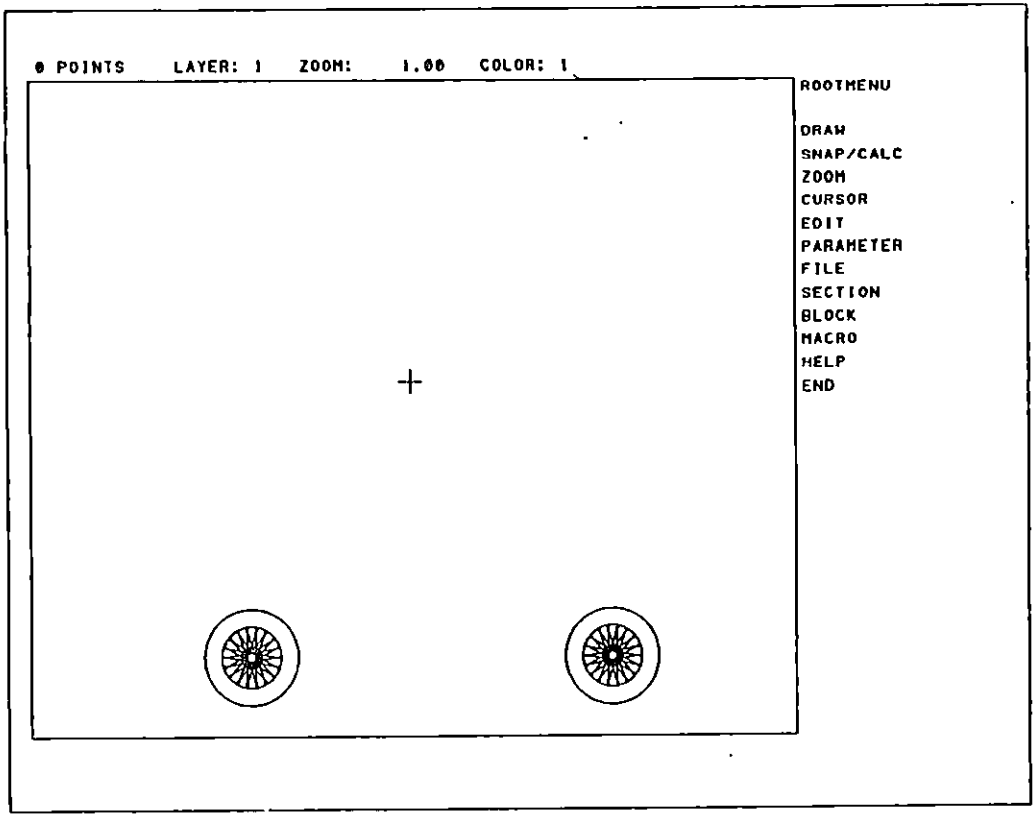

0 POINTS LAYER: 1 ZOOM: 1.00 COLOR: 1
ROOTMENU
DRAW
SNAP/CALC
ZOOM
CURSOR
EDIT
PARAMETER
FILE
SECTION
BLOCK
MACRO
HELP
END

FIGURE 9

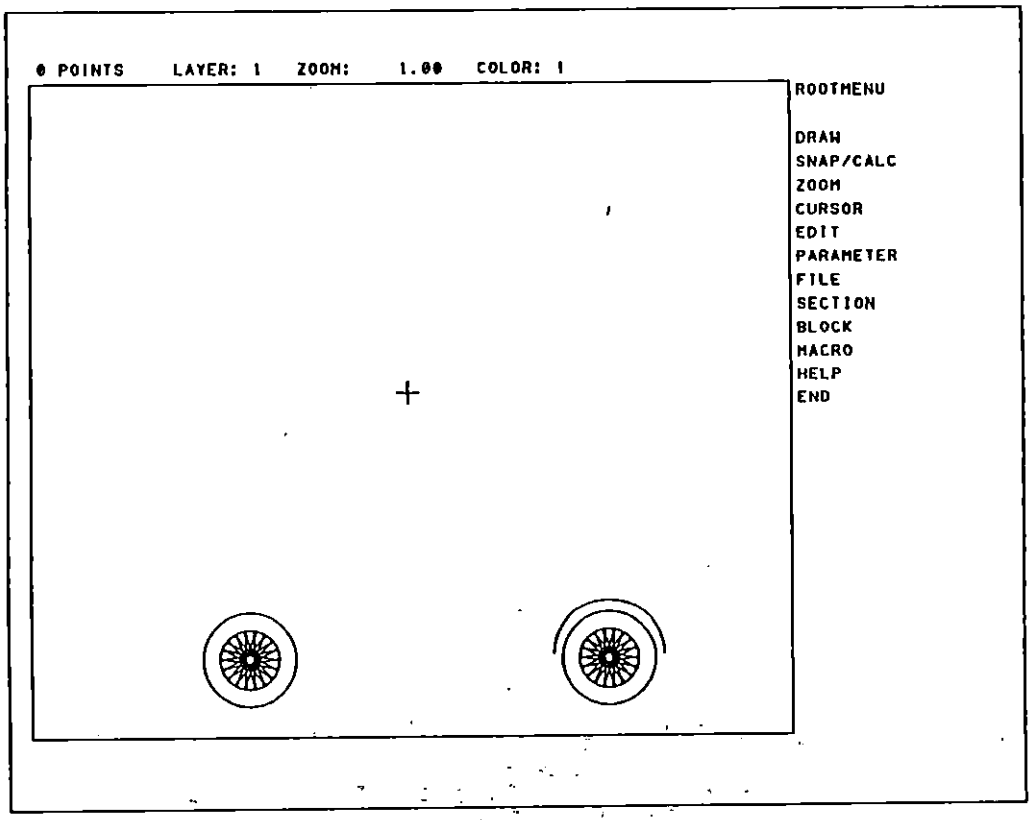

0 POINTS LAYER: 1 ZOOM: 1.00 COLOR: 1
ROOTMENU
DRAW
SNAP/CALC
ZOOM
CURSOR
EDIT
PARAMETER
FILE
SECTION
BLOCK
MACRO
HELP
END

FIGURE 10

. (period)
Right Arrow 7 steps
Up Arrow 2 steps
<INSERT>
Up Arrow 2 steps
Right Arrow 2 steps
<INSERT>
Up Arrow 15 steps
<INSERT>
Up Arrow 2 steps
Left Arrow 2 steps
<INSERT>
Up Arrow 1 step
Left Arrow 2 steps
<INSERT>
Left Arrow 65 steps
Down Arrow 5 steps
<INSERT>
Left Arrow 60 steps
Down Arrow 8 steps
<INSERT>
Down Arrow 4 steps
Left Arrow 4 steps
<INSERT>
Left Arrow 2 steps
Down Arrow 4 steps
<INSERT>
<INSERT> (The second point here will cause sharp angle here, instead of a completely smooth curve.)
Right Arrow 10 steps
Down Arrow 3 steps
<INSERT>
Right Arrow 5 steps
<INSERT>
C (This draws a curve through the points we set. See Figure 11. Now you can see the effect of the two points set at the front of the car.)
<INSERT>

Right Arrow 26 steps
<INSERT>
)
<INSERT>
Right Arrow 51 steps
Up Arrow 1 step
. (period)
V
Up Arrow 24 steps
<INSERT>
Up Arrow 7 steps
Left Arrow 6 steps
<INSERT>
Left Arrow 3 steps
<INSERT>
Left Arrow 25 steps
Down Arrow 3 steps
<INSERT>
C (See Figure 12.)

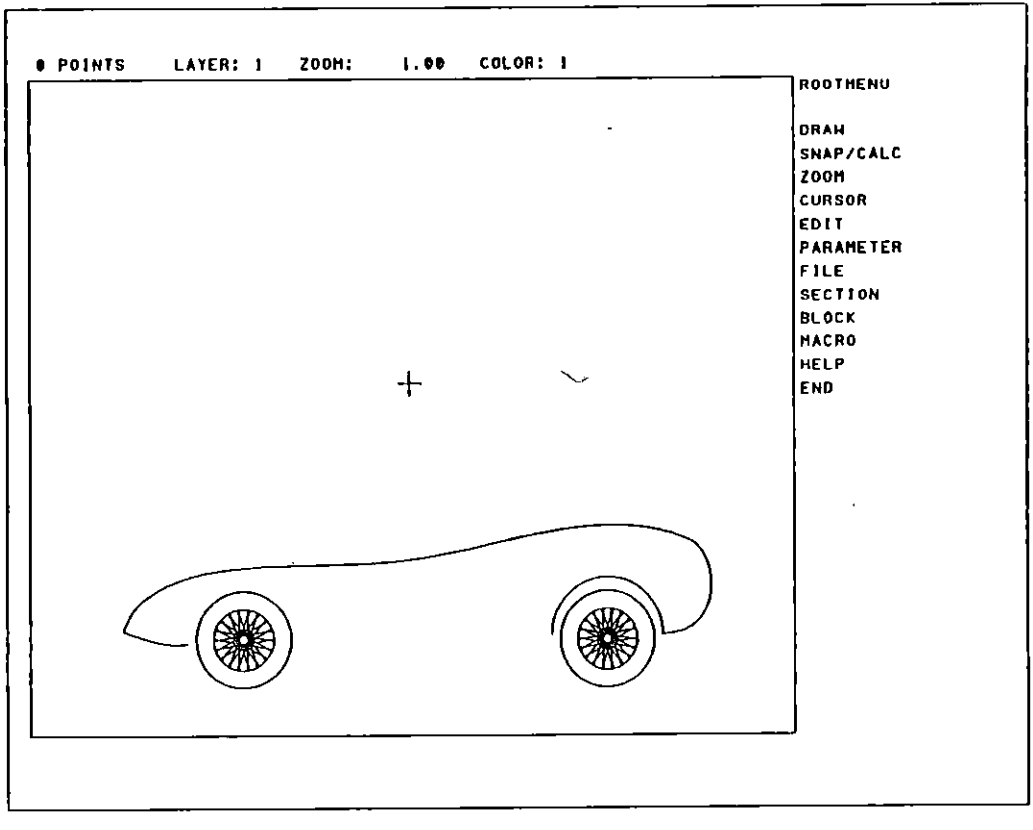

0 POINTS LAYER: 1 ZOOM: 1.00 COLOR: 1
ROOTMENU
DRAW
SNAP/CALC
ZOOM
CURSOR
EDIT
PARAMETER
FILE
SECTION
BLOCK
MACRO
HELP
END

FIGURE 11

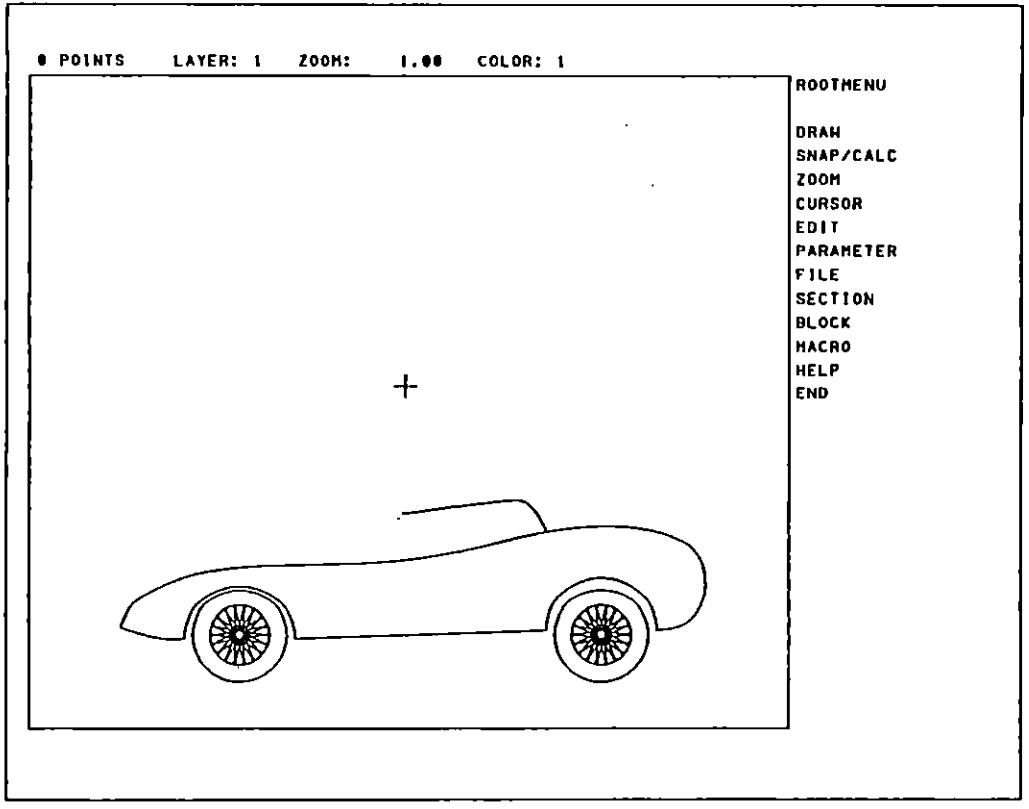

0 POINTS LAYER: 1 ZOOM: 1.00 COLOR: 1
ROOTMENU
DRAW
SNAP/CALC
ZOOM
CURSOR
EDIT
PARAMETER
FILE
SECTION
BLOCK
MACRO
HELP
END

FIGURE 12

```
H
1 <ENTER>              (Red windshields look bad so we
                        will change back to white.)
Down Arrow 11 steps
. (period)
Up Arrow 11 steps
. (period)
. (period)             (This is going to make a sharp
                        corner on a curve again.)
Left Arrow 12 steps
Down Arrow 7 steps
<INSERT>
Left Arrow 5 steps
Down Arrow 5 steps
<INSERT>
C
H
2 <ENTER>
Right Arrow 17 steps
Up Arrow 12 steps
. (period)
Up Arrow 1 step
Right Arrow 2 steps
<INSERT>
Right Arrow 10 steps
Up Arrow 2 steps
<INSERT>
Right Arrow 20 steps
Up Arrow 1 step
<INSERT>
Right Arrow 33 steps
Down Arrow 10 steps
. (period)
C
F10                    (That's Function key 10.  For
                        the first time, we have
                        something worth saving.)
CAR <ENTER>            (See Figure 13.)
```

It may not be the best car you have ever seen, but you should now be able to make curves, parallel

lines, duplicate objects(like the wheels), and even spokes! Use some of the things you have learned to improve the car. Feel free to experiment and discover what you can do on your own. An example of something you can do follows:

Your cursor should still be at the point where the top joins the back of the car.

Up Arrow 12 steps	
Right Arrow 8 steps	
<INSERT>	(This marks the upper right corner of a section.)
Down Arrow 48 steps	
Left Arrow 50 steps	
<INSERT>	(This marks the lower left corner of the section.)
Right Arrow 20 steps	
<INSERT>	(This is where we are going to relocate the lower left corner.)
S	(That means STRETCH. You should look in the Reference Manual to learn more about how STRETCH works.)
Z	(This means ZOOM.)
.7 <ENTER>	(We want to zoom to 70% of our current display size. See Figure 14.)

NOTE: Remember, You are still drawing in RED or color number 2. You should change it before you draw anything else. If you have a problem remembering how, just remember that H is for HUE.

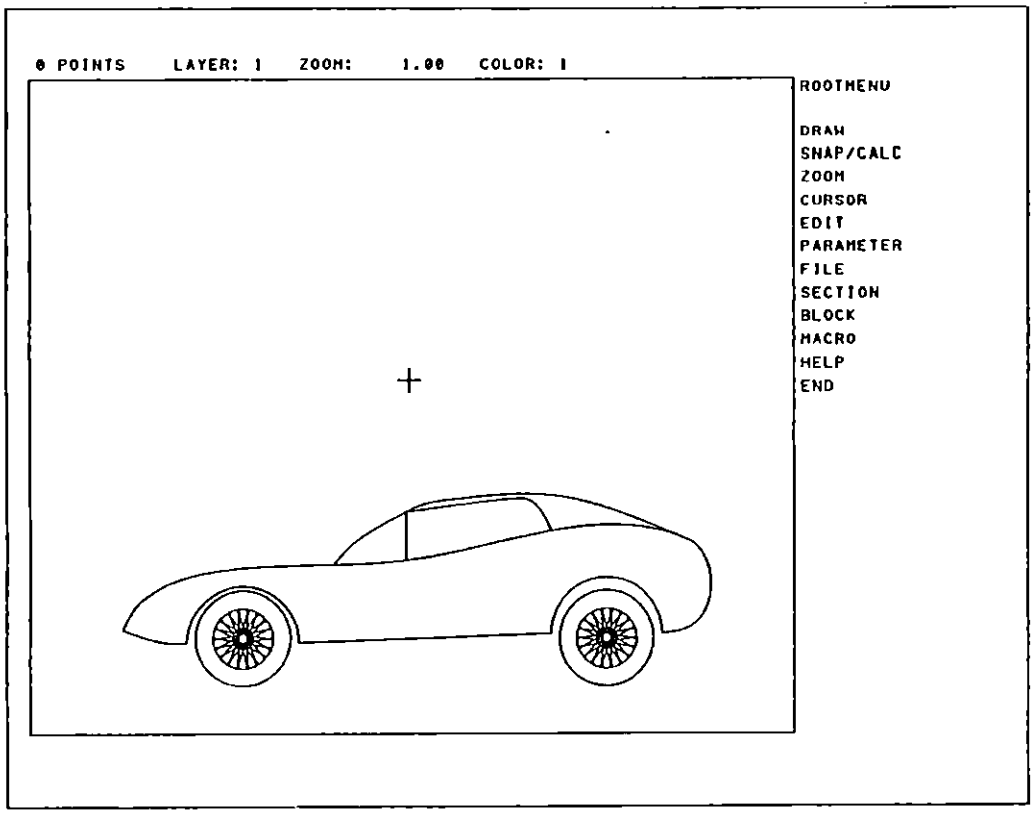

0 POINTS LAYER: 1 ZOOM: 1.00 COLOR: 1
ROOTMENU
DRAW
SNAP/CALC
ZOOM
CURSOR
EDIT
PARAMETER
FILE
SECTION
BLOCK
MACRO
HELP
END

FIGURE 13

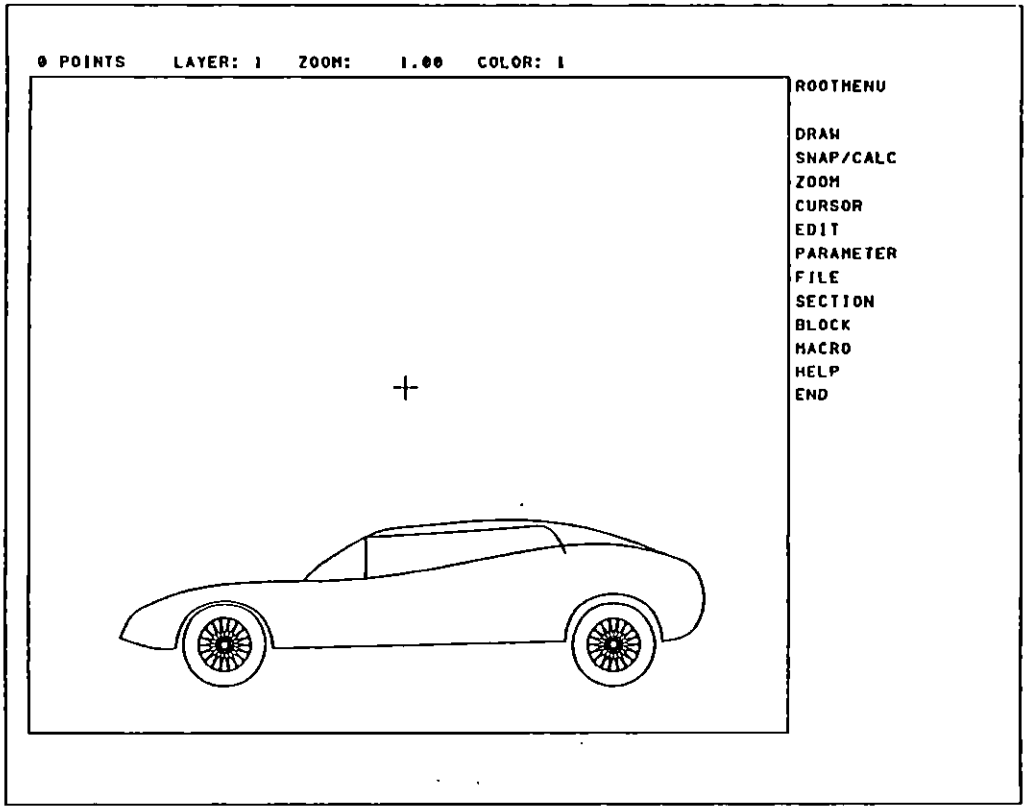

0 POINTS LAYER: 1 ZOOM: 1.00 COLOR: 1
ROOTMENU
DRAW
SNAP/CALC
ZOOM
CURSOR
EDIT
PARAMETER
FILE
SECTION
BLOCK
MACRO
HELP
END

FIGURE 14

LESSON 3 - DRAWING A HOUSE

This lesson will get a little more complicated and a lot more precise.

```
<CTL> Left Arrow
<INSERT>
<CTL> Right Arrow
<INSERT>
U
100 <ENTER>          (We are defining the screen
                      to be 100 units across.)
Q                    (Now use the down arrow key
                      to go to the line that says
                      Cursor Step Size.)
1                    (Set the cursor step size to
                      be one unit.)
F1
<ALT>Q               (Use the down arrow key to go
                      to the line that says:
                     DYNAMIC DIMENSIONING ENABLED Y/N
                      Put a Y on that line and exit
                      the System Status screen by
                      pressing the F1 key.)
Left Arrow 5 steps
<CTL> 1
Up Arrow 8 steps
J                       (We want to display our
                         cursor movement from the
                         last point set so we need to
                         change the status line.)
2 <ENTER>
<INSERT>
Up Arrow 30 steps
<INSERT>
Left Arrow 25 steps
<INSERT>
Left Arrow 2 steps
Up Arrow 2 steps
<INSERT>
Left Arrow 6 steps
<INSERT>
```

Left Arrow 2 steps
Down Arrow 2 steps
<INSERT>
Left Arrow 20 steps
<INSERT>
Up Arrow 17 steps
<INSERT>
Left Arrow 15 steps
<INSERT>
Down Arrow 47 steps
<INSERT>
Right Arrow 15 steps
<INSERT>
Up Arrow 6 steps
<INSERT>
Right Arrow 35 steps
<INSERT>
Down Arrow 6 steps
<INSERT>
Right Arrow 20 steps
<INSERT>
V (See Figure 15.)
Left Arrow 1 step
<INSERT>
;
.5 <ENTER> (We want the exterior walls to be 6" or 1/2 foot thick.)

90 <ENTER>
= (This draws a parallel line. See Figure 16. This is the preferred method of drawing walls of a building. Do not be tempted to use wide lines to draw walls. Wide lines do not have edges. The sides of the wide line cannot be cut, deleted, snapped to or otherwise edited.)

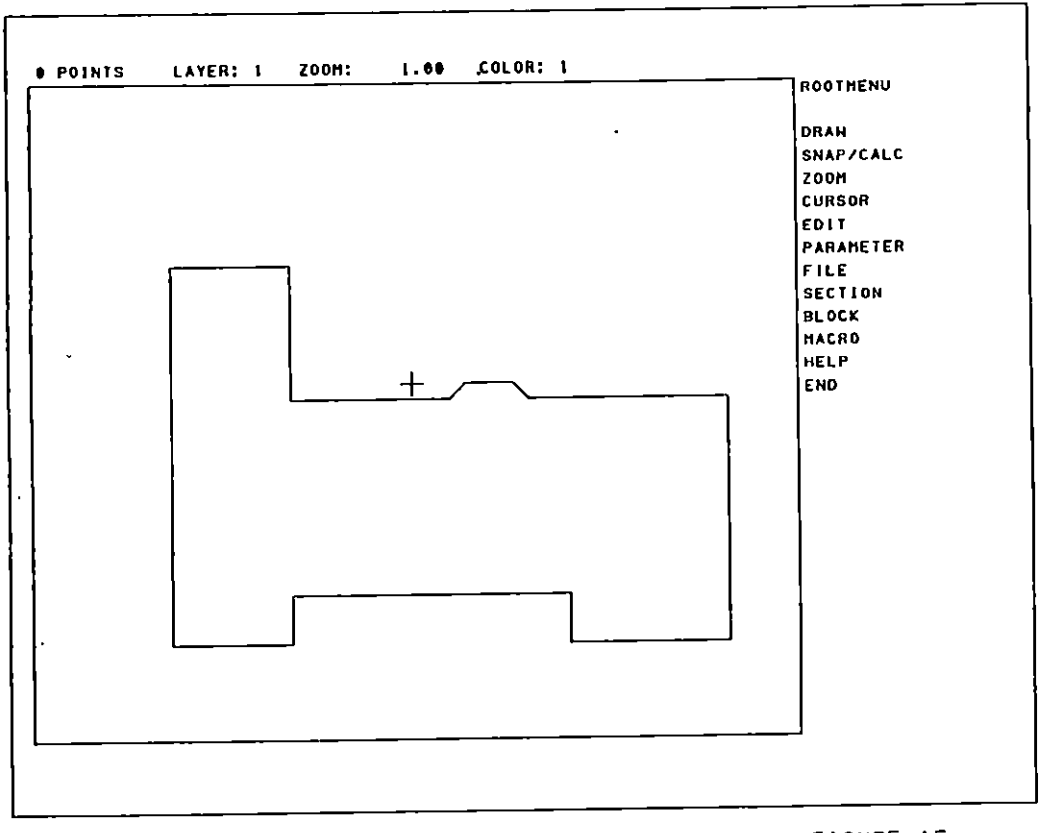

0 POINTS LAYER: 1 ZOOM: 1.00 COLOR: 1
ROOTMENU
DRAW
SNAP/CALC
ZOOM
CURSOR
EDIT
PARAMETER
FILE
SECTION
BLOCK
MACRO
HELP
END

FIGURE 15

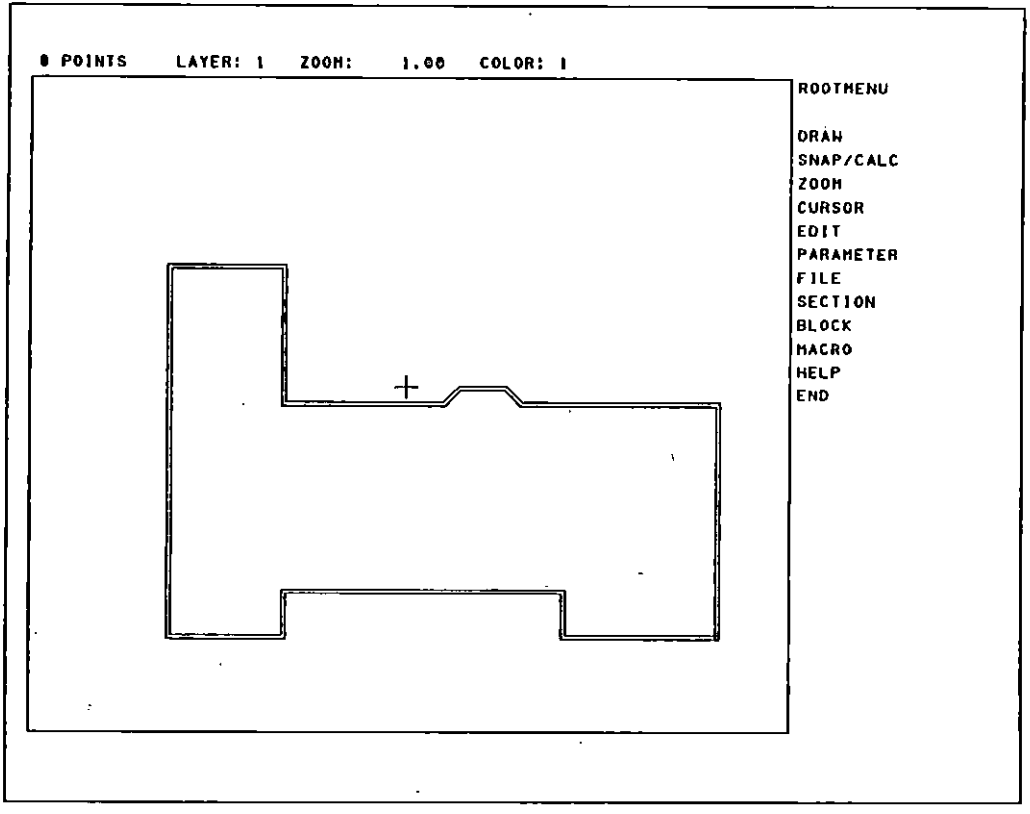

0 POINTS LAYER: 1 ZOOM: 1.00 COLOR: 1
ROOTMENU
DRAW
SNAP/CALC
ZOOM
CURSOR
EDIT
PARAMETER
FILE
SECTION
BLOCK
MACRO
HELP
END

FIGURE 16

Left Arrow 1 step
Up Arrow 1 step
<INSERT>
Down Arrow 2 steps
Left Arrow 15 steps
<INSERT>
<ALT> D
Left Arrow 3 steps
. (period) (The period key causes the cursor to jump to the nearest existing point on the drawing and set a point at that location.)

Left Arrow 35 steps
. (period)
V (See Figure 17.)
Up Arrow 5 steps
Right Arrow 5 steps
<INSERT> (This is the lower left corner of a section.)

Right Arrow 4 steps
Up Arrow 2 steps
<INSERT> (This is the upper right corner of the section.)
<ALT> D (This breaks the lines AND deletes everything in the section with a single command.)

Right Arrow 7 steps
<ENTER>
LS <ENTER> (This snaps to the nearest location on the line nearest to the cursor.)

Up Arrow 10 steps
<INSERT>
Right Arrow 19 steps
<INSERT>
Down Arrow 8 steps
<INSERT>
V

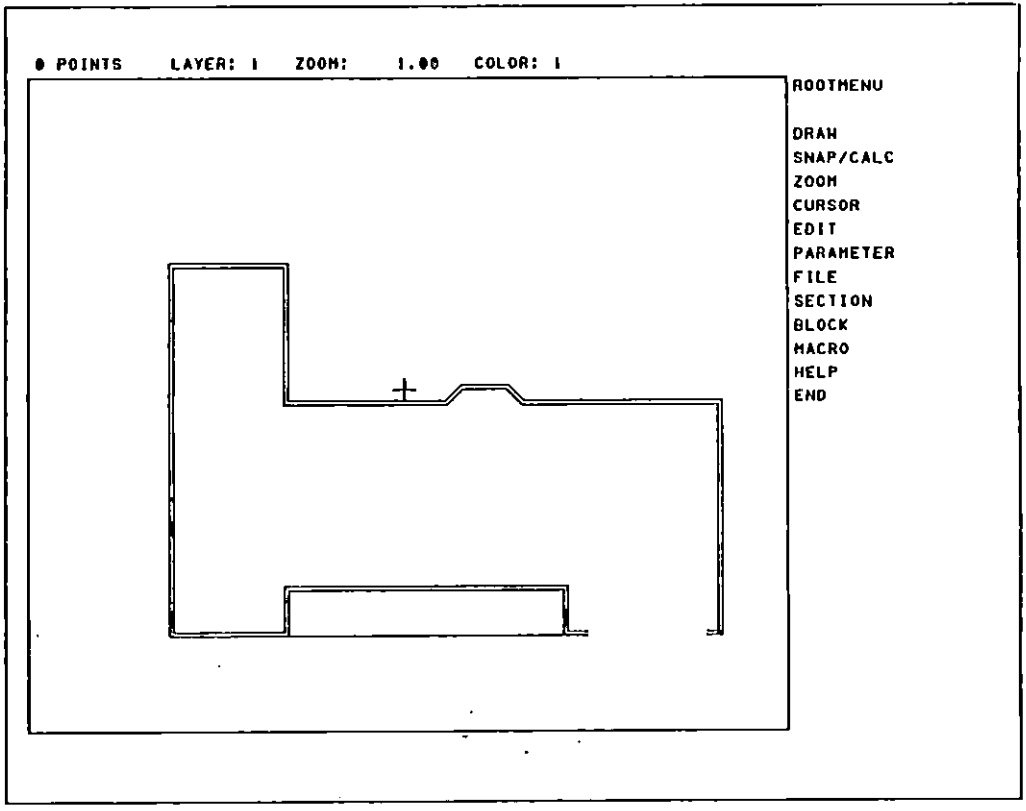

0 POINTS LAYER: 1 ZOOM: 1.00 COLOR: 1
ROOTMENU
DRAW
SNAP/CALC
ZOOM
CURSOR
EDIT
PARAMETER
FILE
SECTION
BLOCK
MACRO
HELP
END

FIGURE 17

```
<INSERT>
;
.333 <ENTER>          (We want the interior walls
                       to have a thickness of 4
                       inches or .333 feet.)
0 <ENTER>             (The number, not the letter.)
=
Left Arrow 1 step
,                     (The comma key causes the
                       cursor to jump to the
                       nearest existing point
                       on the drawing but it does
                       NOT set a point at that
                       location.)
Up Arrow 8 steps
<INSERT>
Up Arrow 12 steps
<ENTER>
LS <ENTER>
V
Down Arrow 1 step
<INSERT>
;
.333 <ENTER>
0 <ENTER>             (The number, not the letter.)
=
Left Arrow 36 steps
. (period)
Left Arrow 14 steps
<ENTER>
LS <ENTER>
V
Right Arrow 1 step
<INSERT>
;
.333 <ENTER>
90 <ENTER>
=
Right Arrow 13 steps
Down Arrow 23 steps
. (period)
```

```
Up Arrow 20 steps
<INSERT>
V
Down Arrow 1 step
<INSERT>
;
.333 <ENTER>
0 <ENTER>
=
Left Arrow 14 steps
Down Arrow 26 steps
, (comma)
Up Arrow 10 steps
<INSERT>
Right Arrow 13 steps
<ENTER>
LS <ENTER>
V
Left Arrow 1 step
<INSERT>
;
.333 <ENTER>
90 <ENTER>
=
, (comma)
Left Arrow 3 steps
<INSERT>
Up Arrow 13 steps
<INSERT>
Left Arrow 10 steps
<ENTER>
LS <ENTER>
V
Right Arrow 1 step
<INSERT>
;
.333 <ENTER>
90 <ENTER>
=
Right Arrow 10 steps
<INSERT>
```

```
Up Arrow 5 steps
<ENTER>
LS <ENTER>
V
Down Arrow 1 step
<INSERT>
;
.333 <ENTER>
0 <ENTER>
=                    (See Figure 18.)
L                    (This lets us change layers.)
3                    (This makes layer 3 the current
                      layer.)
F1
<CTL> Left Arrow
<CTL> 1
. (period)
<CTL> Right Arrow
. (period)
Down Arrow 5 steps
<INSERT>
<SHIFT> @
<CTL> Left Arrow
<CTL> 7
. (period)
Down Arrow 47 steps
. (period)
Left Arrow 5 steps
<INSERT>
<SHIFT> @
<ALT>Q               (Use the down arrow key to go
                      to the line that says:
                     DYNAMIC DIMENSIONING ENABLED Y/N
                      Put a N on that line and exit
                      the System Status screen by
                      pressing the F1 key.)
H
2 <ENTER>
<CTL> Left Arrow
<CTL> 7
Right Arrow 26 steps
```

```
. (period)
<CTL> Right Arrow
. (period)
Up Arrow 25 steps
<INSERT>
<SHIFT> @
<CTL> Left Arrow
Right Arrow 41 steps
. (period)
<CTL> Right Arrow
<CTL> 1
Up Arrow 8 steps
. (period)
Right Arrow 3 steps
<INSERT>
<SHIFT> @              (See Figure 19.)
H
1 <ENTER>
```

We won't take the time to do all of the doors and windows here, but we will do one window now to show you how it is done.

```
L
1
F1
Up Arrow 30 steps
, (comma)
Left Arrow 40 steps
Down Arrow 1 step
<INSERT>
Up Arrow 2 steps
Left Arrow 6 steps
<INSERT>
<ALT> D
. (period)
Down Arrow 1 step
. (period)
V
Right Arrow 6 steps
. (period)
```

```
Up Arrow 1 step
. (period)
V
. (period)
Left Arrow 6 steps
. (period)
V
F10                    (Save the drawing.)
HOUSE <ENTER>
```

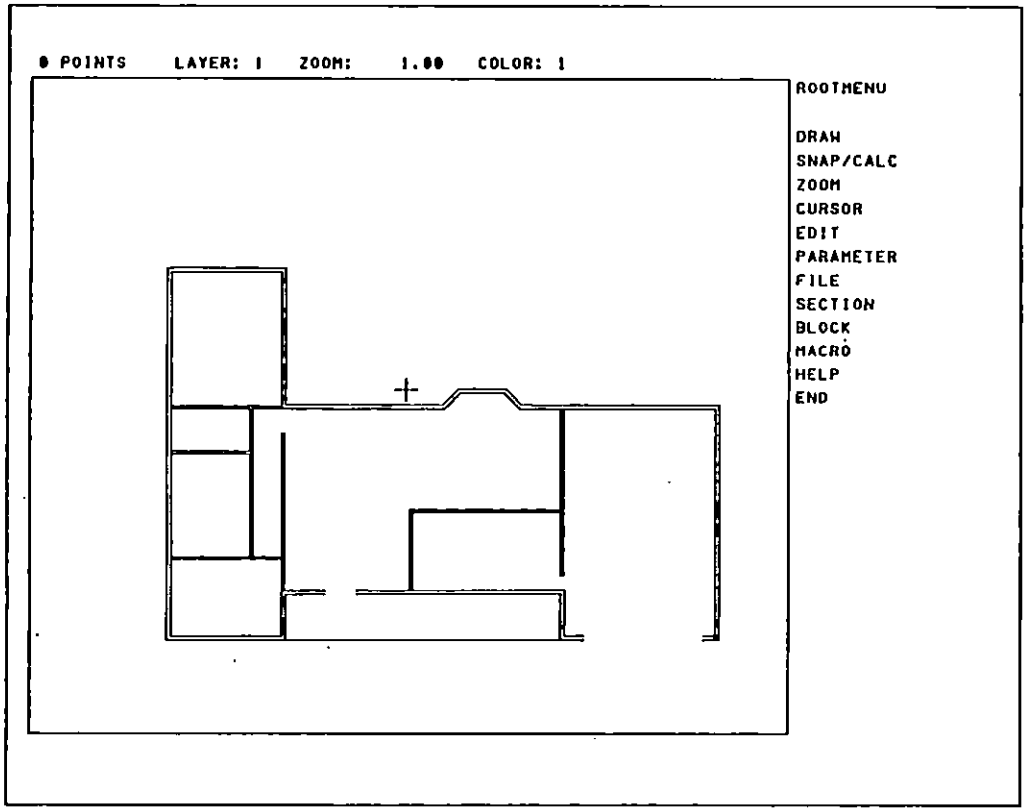

0 POINTS LAYER: 1 ZOOM: 1.00 COLOR: 1
ROOTMENU
DRAW
SNAP/CALC
ZOOM
CURSOR
EDIT
PARAMETER
FILE
SECTION
BLOCK
MACRO
HELP
END

FIGURE 18

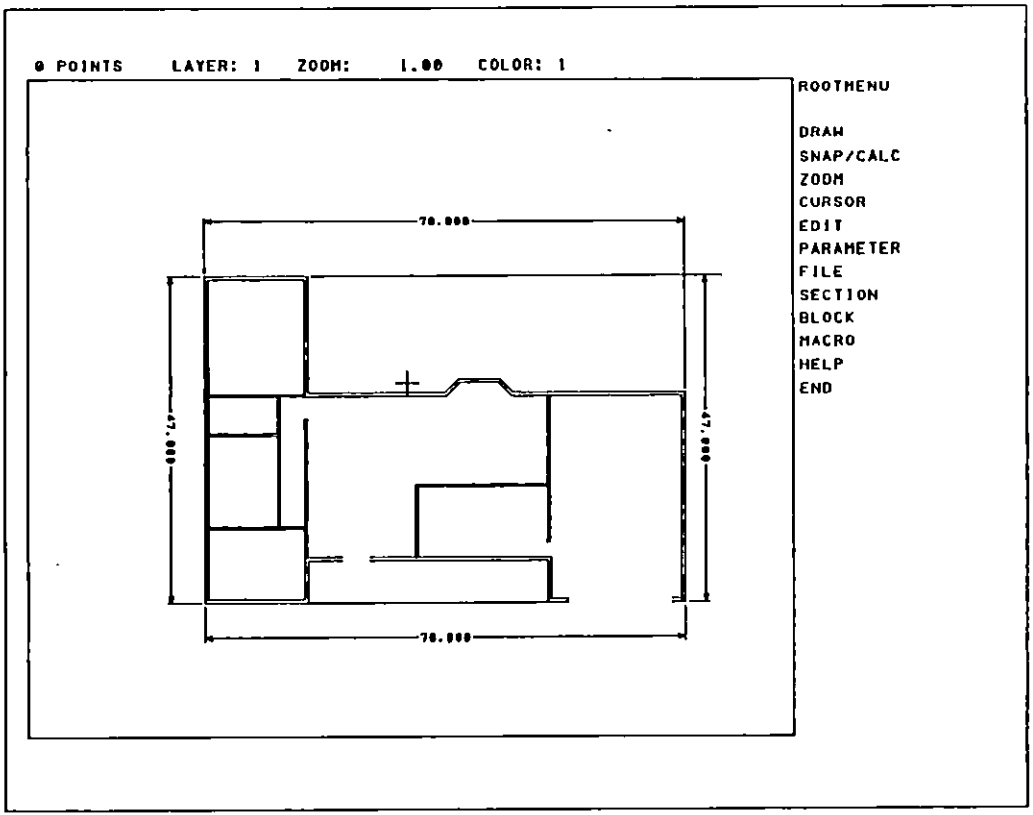

0 POINTS LAYER: 1 ZOOM: 1.00 COLOR: 1
ROOTMENU
DRAW
SNAP/CALC
ZOOM
CURSOR
EDIT
PARAMETER
FILE
SECTION
BLOCK
MACRO
HELP
END
78.000
47.000
47.000
78.000

FIGURE 19

LESSON 4: PRINTING A SCALE DRAWING.

Retrieve the house saved from Lesson 3. Use the System Parameter command (ALT-Q) to specify 8 Drawing Units per inch on output. This means that the house will be drawn at a scale of 1 inch equals 8 feet. Use the System Parameter command (ALT-Q) to verify that the Drawing and System parameters will be saved with the drawing, and then save the drawing with the F10 key.

To start the Print command, press F5. You will not need to save the drawing again, since you already have. If you do not have a hard drive, you will be asked to replace the DesignCAD program disk with the Print disk.

Under the Print command, select the option to print a drawing, and enter the file name for your house. On the next screen, you have the chance to change the output resolution, size, scale, and other information. For this example, press the F1 key and use these parameters. Your drawing will be printed according to the scale of 1 inch equals 8 Drawing Units (feet).

Try printing the drawing again at other densities and scales. You can change the scale by specifying the actual output size or by entering the Drawing Units per Inch. Notice that the drawing cannot be output at a size larger than the printer.

A scale drawing can be plotted in the same manner using the Plot command (F6 key). The Plot command does not require that the drawing be saved to disk, however. It plots the current drawing at the current Drawing Units per Inch (unless specified otherwise).

If the Drawing Units per Inch is set to zero, the drawing will be output to the printer or plotter at the maximum possible size.

LESSON 5: USING MENU COMMANDS

Lessons 1 through 4 are designed for use with keystroke DesignCAD commands. This lesson is concerned with using menu commands.

Before you continue with this lesson, read the section in the Reference Manual entitled "DesignCAD Menu Commands".

The Command menu at the side of the drawing screen can be enabled or disabled using the System Parameter command (ALT-Q, or SYSTEM). The menu commands can be entered from the keyboard as well as from the command menu.

Most of the keystroke commands have corresponding menu commands. There are several menu commands that do not have corresponding keystroke commands, however. In this lesson, we will concentrate on those commands.

When the phrase "enter AREA" or "enter <command>" is used in this and following lessons, it means to enter the command either from the menu or from the command line. Either method works the same. If you are entering the command from the command line, the short form of the command can be used (A3 instead of ARC-3, for example).

First, draw a box on the screen about 3 inches square using the Box menu command. To do this, enter BOX and set two points in opposite corners of the rectangle to be drawn. (BOX is found on the DRAW menu.)

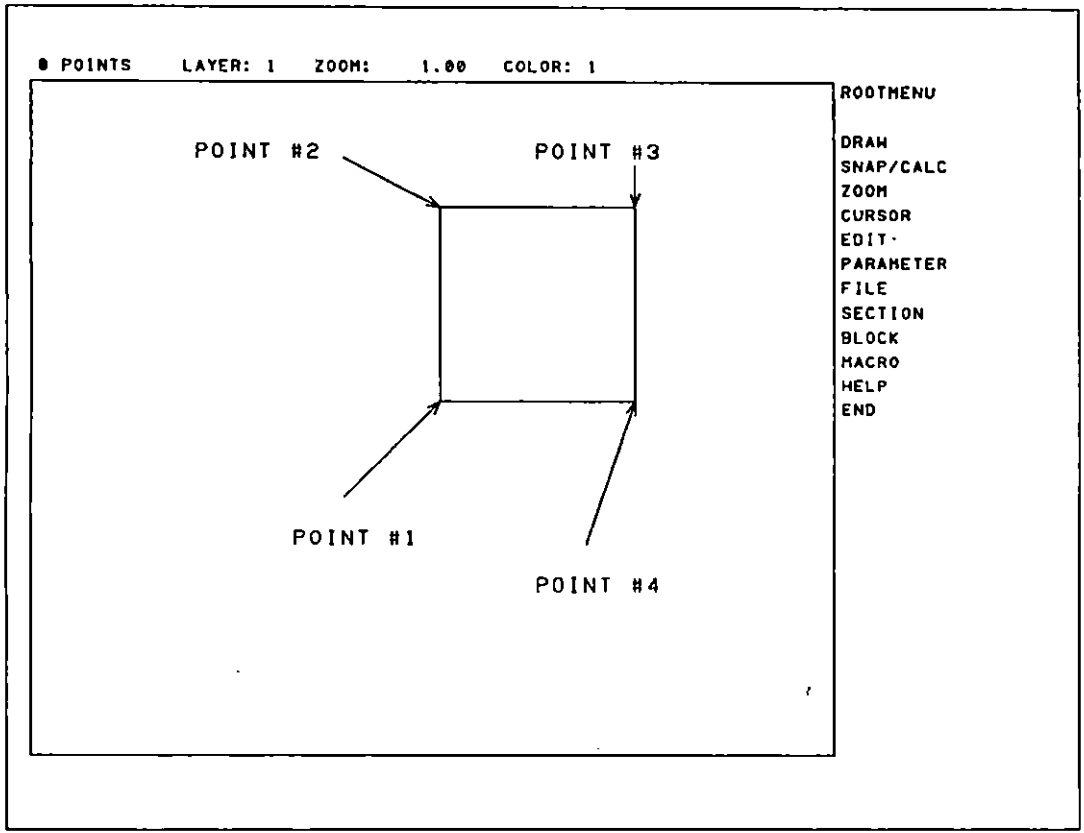

0 POINTS LAYER: 1 ZOOM: 1.00 COLOR: 1
ROOTMENU
DRAW
SNAP/CALC
ZOOM
CURSOR
EDIT·
PARAMETER
FILE
SECTION
BLOCK
MACRO
HELP
END
POINT #2
POINT #3
POINT #1
POINT #4

FIGURE 20

Next, fill the inside of the box with a brick pattern. This can be done with the Hatch command. Enter HATCH, set points on the 4 corners of the box as shown in Figure 20, and press ENTER. (HATCH is also found on the DRAW menu.)

When asked form the pattern, enter BRICK. When asked for the scale and angle of the pattern, press ENTER to use the default of scale=1 and angle=0. A brick pattern will then be drawn as shown in Figure 20.

The area and perimeter of the box can be calculated using either of two DesignCAD commands. First, using the Area command to get the area of the box. Enter AREA, set 4 points as you did with the Hatch command, and press ENTER. (AREA is found on the SNAP/CALC menu.) The area and perimeter of the polygon defined by the 4 points will be displayed at the bottom of the screen.

A second way to calculate Area is with the ID command. Enter ID, and set a point on the box. The area and length of the box will be displayed on the second line of information at the bottom of the screen.

LESSON 6: DIMENSIONS AND LAYERS

Clear the screen by pressing the Y key twice. Retrieve the house saved in Lesson 3 using the Retrieve command (F9 key). Retrieve it without setting any points. This causes the house to be located at its original position.

Press the L key. Using the down arrow key, go to Layer 3 and place a 0 (zero) in that line. Press F1 to exit the layer command. Notice that the house is redrawn without the dimensioning information. This is because we draw the dimensioning information on layer #3 and it is now turned off.

Press the L key. Using the down arrow key, go to Layer 3 and place a 1 (one) on that line. Press F1 to exit the layer command. The house is redrawn WITH the information on layer #3 this time because we turned layer #3 back on.

Press the L key. Press the F5 key. Press 3 and then <ENTER>. Press 3 and <ENTER>. Press F1 to exit the layer command. The house is redrawn, but this time the dimensioning information is a new color (green on most systems).

Dynamic dimensioning is different from non-dynamic dimensioning in several ways.

1. Non-dynamic dimensioning can be edited. Dynamic dimensioning cannot be edited. It is handled by DesignCAD as a single entity while non-dynamic dimensioning is a collection of lines, arrows and numbers.

2. Changing the value of a unit has no effect on non-dynamic dimensioning but it will cause the values in dynamic dimensioning to automatically update to reflect the current value of a unit.

3. Moving dimensioned points or stretching dimensioned areas could cause a change in dynamic dimensioning, but would not effect the numbers in non-dymanic dimensioning.

To see these differences, try the following:

<INSERT>
Right Arrow 1 step
U
2 <ENTER>

The house is redrawn with new values in the dynamic dimensioning while the non-dynamic dimensioning remains unchanged. The non-dynamic dimensioning is closer to the house (and red if you have a color display).

Let's return the dimensions to their original values:

<INSERT>
Left Arrow 1 step
U
1 <ENTER>

HELP!!!

The following pages contain questions and answers to questions received by our technical support people. Most of the questions we receive are hardware related. We feel that if we are able to answer some of your questions here it may save you a phone call. If you are having problems with a particular piece of hardware please consult the manuals supplied with the hardware. However, if you are still having problems feel free to give us a call.

QUESTION: WHEN I TRY TO RUN DesignCAD, THE COPYRIGHT MESSAGE APPEARS, BUT NOTHING ELSE HAPPENS. WHAT'S WRONG?

ANSWER: Either you have not run SETUP or you have selected the incorrect display adapter. It is also possible that configuration switches on your display adapter are set incorrectly.

QUESTION: WHEN I TRY TO RUN DesignCAD ALL I GET IS A FLASHING CURSOR IN THE UPPER LEFT CORNER OF THE SCREEN. WHAT'S WRONG?

ANSWER: Either you have not run SETUP or you have selected the incorrect display adapter. It is also possible that configuration switches on your display adapter are set incorrectly.

QUESTION: WHEN I TRY TO RUN DesignCAD I GET AN INSUFFICIENT MEMORY ERROR. DO I NEED MORE MEMORY?

ANSWER: Probably not. Run the MSDOS command CHKDSK. The bottom line must say that you have at least 430,000 bytes of RAM memory available. If you have a computer which has at least 512K RAM and have less then 430,000 bytes available, it probably means that

you have some RAM resident software installed. This may include RAM-Disk software, Print Spoolers, or other applications. If you are not sure what software may be installed, check your AUTOEXEC.BAT and CONFIG.SYS files.

QUESTION: I HAVE AN IBM COLOR GRAPHICS ADAPTER AND CAN ONLY GET BLACK, WHITE, AND TWO OTHER COLORS. WHY?

ANSWER: The IBM CGA card is displaying a background and three other colors in 320 x 200 resolution. It can display only black and white at 640 x 200 resolution. It can display 16 colors in text mode only.

QUESTION: I HAVE AN ENHANCED GRAPHICS ADAPTER. I CAN'T GET IT TO DISPLAY ALL 16 COLORS. WHY?

ANSWER: The Enhanced Graphics Adapter (EGA) can display 16 colors in high resolution mode only if it has 128K RAM or more on the EGA board.

QUESTION: MY AT&T 6300 COMPUTER WON'T DISPLAY 16 COLORS IN HIGH RESOLUTION. WHY?

ANSWER: The AT&T 6300 can display a background and three other colors in 320 x 200 resolution. It can display black and white in the 640 x 400 resolution. You can get 16 colors in 640 x 400 resolution only if you have the AT&T Display Enhancement Board (DEB).

QUESTION: MY DOT MATRIX PRINTER WON'T PRINT. WHAT AM I DOING WRONG?

ANSWER: Make sure that you have selected the proper printer driver in the SETUP program. On many dot matrix printers there is a "PC" mode. Your dot

matrix printer should probably use this option. On almost all printers there is a bank of configuration switches. These switches must be properly set. In most instances the factory setting is the proper setting for use with DesignCAD.

QUESTION: WHEN I TRY TO PRINT A DRAWING ON MY DOT MATRIX PRINTER EVERY OTHER LINE PRINTED IS BLANK. WHY?

ANSWER: The printer has a configuration switch which internally generates a line feed character when a carriage return character is received. This option should be disabled.

QUESTION: WHEN USING THE HIGH RESOLUTION MODE IT SEEMS TO TAKE A LONG TIME TO PRINT A COMPLICATED DRAWING. WHY?

ANSWER: DesignCAD outputs a tremendous amount of data when it is printing. Even a small drawing can result in 4-5 million "dots" being sent to the printer. When you use a wide carriage printer, 10 million or more "dots" are sent to the printer.

Because of the large number of calculations and the large amount of data being output we offer various resolutions of output for dot matrix printers. We suggest that on very large drawings that you use one of the lower resolutions for proofing.

QUESTION: I AM HAVING PROBLEMS GETTING MY OKIDATA PRINTER TO WORK CORRECTLY. WHAT AM I DOING WRONG?

ANSWER: The most common problem here is selecting the wrong printer in SETUP. Generally there are two different types of Okidata Printers. One uses printer control codes that are unique to Okidata

printers. The other uses printer control codes that mimic the IBM graphic printer of Epson printers. You must select the correct printer when you run SETUP.

QUESTION: MY MOUSE WON'T WORK. WHY?

ANSWER: You MUST run the mouse driver software supplied with your mouse. The mouse driver is usually a COM file names "MOUSE.COM" or "MSMOUSE.COM." The mouse driver must be run BEFORE running DesignCAD.

QUESTION: MY DIGITIZER WON'T WORK. WHY?

ANSWER: The problem probably lies in your switch settings or in the cable between the digitizer and the computer. Please consult the DesignCAD Reference Manual for the correct switch settings and cabling information.

INDEX

ARC 23
aspect ratio 14
AT&T COMPUTER 72
backup 6, 8, 10
block 28, 40
block circle 31, 40
block insert 40
CIRCLE 22
cleanup 33
CLEAR SCREEN 20
color 41
COLOR GRAPHICS ADAPTER 72
COMMAND, PRINT 65
configuration 12
Configuration Disk 8
cursor keys 17
cursor step size 27
curve 44
DELETE 27, 56
digitizer menu 14
digitizing tablet 12, 14, 74
dimensioning 52, 60, 69
display 13
DRAWING PARAMETER 27
DRAWING UNITS 27, 65
ENHANCED GRAPHICS ADAPTER 72
ERASE 27
erase line 37
fixed disk drive 6
floopy disk drive, 3.5" 10
floppy disk drive, 5.25" 8
getting started 6, 8
graphics adapter 13, 71
graphics tablet 12, 14
handle 31, 40
hard drive 6
HATCH 68
HELP 71

join 33
layers 60
linesnap 56
math coprocessor 4, 5
MEMORY 71
memory requirements 1
MENU 15
monitor 13
mouse 12, 74
parallel line 39, 53
peripheral devices 12
plotter 12
POINTS, SETTING 19
polygon 36
PRINT 65
printer 12
printing 5, 73
Program Disk 8
RAM 1, 71
RAM RESIDENT SOFTWARE 72
RAM-resident software 15
saving a drawing 48
scale 65
SCALE DRAWING 65
section 33, 40
semi-circle 41
SETUP 12, 71
snap 56, 58
status line 52
stretch 49
symbol library 5
system requirements 1
TEXT 24
Text 24
UNDO 20
UNITS 27
utility programs 4
ZOOM 26, 49